D-PE 2397

BARNUM TIMBER COMPANY
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November 10, 1998

Mr. Bruce Halstead
U.S. Fish and Wildlife Service
1125 16th Street
Arcata, CA 95521

Dear Mr. Halstead:

Please accept the following comments on the Pacific Lumber Company Habitat Conservation Plan (PL-HCP). The comments are being submitted on behalf of Barnum Timber Company. Barnum Timber Company owns approximately 45,000 acres of timberland in Humboldt, Mendocino, and Trinity Counties.

The provisions in the PL-HCP provide environmental regulation that is significantly more stringent than what is required of private timberland owners in the State of California. The increased regulation on PL's timber operations proposed in the PL-HCP, along with the discounted sale of "Headwaters Forest" to the State and Federal governments by Pacific Lumber Company, we believe, is based solely on the political expediency to gain regulatory certainty. The protection measures for public trust resources proposed in the PL-HCP exceed what is reasonably suggested by the scientific literature, and therefore are unwarranted based on purely environmental factors.

BTC-1

The claims that continued logging by Pacific Lumber Company under the existing California forest practice regulations and the requirements of the State and Federal Endangered Species Act will result in harm to coho salmon are baseless. Please include into the record that supports your decision a report commissioned by the Oregon State Legislature, titled *Status and Future of Salmon of Western Oregon and Northern California: Findings and Options* (Botkin, et al., 1995). This report was partially funded by the California Department of Forestry and Fire Protection.

The so called "Botkin Report" is a distillation and analysis of existing scientific information regarding the relative importance of forest practices to the decline in anadromous fish populations, and to make recommendations as to how forest practices can assist in recovery of anadromous fish populations. This report clearly moves beyond rhetoric, hyperbole, and gross overstatements to describe what is known about salmonid populations and human activities in western Oregon and northern California.

Of significant importance to the issue of riparian buffers, the Botkin Report identifies Oregon Department of Forestry water protection rules as being ". . . as defensible as any other general guideline available at present" (Botkin, et al., 1995; page 81). California forest practice rules currently require post-harvest conditions in riparian zones similar to Oregon Department of Forestry water protection rules. The PL-HCP contains significantly more conservative protection measures than both the California forest practice rules or the Oregon Department of Forestry water protection rules. BTC-1 con.

Your scientific team must consider the potential scenario that what is being proposed in the PL-HCP regarding tree retention standards along fish bearing streams may in fact lead to conditions that reduce stream productivity for fish. Attached is a copy of a report by James W. Burns of the California Department of Fish and Game, who identifies that "cold streams, shaded by dense forest canopies are not the optimum trout habitats" (Burns, 1972; page 14.) Some of Burns' (1972) data was collected on areas covered by the PL-HCP. BTC-2

Attached please also find an article from the *Journal of Financial Economics* that may provide your team with information necessary for political resolve of the decision you must make regarding the PL-HCP. The article by DeAngelo and DeAngelo (1998) provides insight into the current political state of affairs regarding Pacific Lumber Company. BTC-3

In closing, we also ask that in your decision you re-affirm the intent of the Headwaters Forest acquisition legislation that other timber companies are not to be held to the standards negotiated between the Federal and State government and Pacific Lumber Company. This can be done only by clearly stating all the assumptions and constraints that accompanied your negotiations with Pacific Lumber Company.

Sincerely,

Stephen R. Horner
Registered Professional Forester #2441

Reference List

1. Botkin, Daniel; Cummins, Kenneth; Dunne, Thomas; Reiger, Henry; Sobel, Matthew; Talbot, Lee; and Simpson, Lloyd.1995. Status and Future of Salmon of Western Oregon and Northern California: Findings and Options. 8. Santa Barbara, California, The Center for the Study of the Environment.

2. Burns, J.W. 1972. Some effects of logging and associated road construction on Northern California streams. *Transactions of the American Fisheries Society* 101:1-17.

3. DeAngelo, H. and L. DeAngelo. 1998. Ancient redwoods and the politics of finance: the hostile takeover of the Pacific Lumber Company. *Journal of Financial Economics* 1998:3-53

RESEARCH REPORT

Status and Future of Salmon of Western Oregon and Northern California: Findings and Options

The Center For
The Study Of
The Environment

Status and Future of Salmon of Western Oregon and Northern California:

FINDINGS AND OPTIONS

REPORT # 8

May 1995

Daniel Botkin, Kenneth Cummins, Thomas Dunne,
Henry Regier, Matthew Sobel, Lee Talbot and Lloyd Simpson

A Non-Profit Corporation
Santa Barbara, California

805-963-5088

TRANSACTIONS of the AMERICAN FISHERIES SOCIETY

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NUMBER 1

Some Effects of Logging and Associated Road Construction on Northern California Streams[1]

JAMES W. BURNS

California Department of Fish and Game, Sacramento, California 95814

ABSTRACT

The effects of logging and associated road construction on four California trout and salmon streams were investigated from 1966 through 1969. This study included measurements of streambed sedimentation, water quality, fish food abundance, and stream nursery capacity. Logging was found to be compatible with anadromous fish production when adequate attention was given to stream protection and channel clearance. The carrying capacities for juvenile salmonids of some stream sections were increased when high temperatures, low dissolved oxygen concentrations, and adverse sedimentation did not accompany the logging. Extensive use of bulldozers on steep slopes for road building and in stream channels during debris removal caused excessive streambed sedimentation in narrow streams. Sustained logging prolonged adverse conditions in one stream and delayed stream recovery. Other aspects of logging on anadromous fish production on the Pacific Coast are discussed.

INTRODUCTION

A major concern of resource managers on the Pacific Coast of the United States and British Columbia has been the effect of timber harvest and associated road construction on salmon and trout. At first interest focused on log jams blocking salmon (*Oncorhynchus* spp.) and steelhead trout (*Salmo gairdneri*) from their spawning grounds. California resolved this problem by a law requiring clear passage for fish and by a log jam removal program (Mongold, 1964). Then interest shifted to damage caused by bulldozers working in streambeds and along stream banks (Calhoun, 1962, 1966) and to erosion resulting from improper road and skid trail construction on steep terrains (Cordone and Kelley, 1961; Calhoun, 1967). In July 1966, the California Department of Fish and Game initiated a study in northern California watersheds to determine the effects of logging and associated road building on stream salmonids. This report describes the study from 1966 through 1969 and summarizes the resulting conclusions about streambed sedimentation, water quality, fish food abundance, and stream nursery capacity.

STUDY AREA

Four small streams on the northern California coast were chosen for study (Figure 1): Bummer Lake Creek, South Fork Yager Creek, Little North Fork Noyo River, and South Fork Caspar Creek. They are located within 40 km of the ocean and drain watersheds ranging from 425 to 2,514 ha (Table 1). The watersheds are relatively steep, with canyon sides having mean slopes ranging from 36 to 49%. The coastal climate is characterized by heavy winter rainfall and dry summers. Mean annual precipitation varies from

[1] This study was performed as part of Dingell-Johnson California Project F-10-R, "Salmonid Stream Study," supported by Federal Aid to Fish Restoration funds.

1050 - 6200 Ac.

TABLE 1.—*Characteristics of the streams and watersheds*

	Bummer Lake Creek	South Fork Yager Creek	North Fork Noyo River	South Fork Caspar Creek
Drainage area of watershed (ha)	1,400	2,514	989	425
Average canyon slope in study section (%)	45	38	36	49
Stream distance from study section to ocean (km)	28.5	40.0	16.0	11.2
Study section length (m)	1,324	1,119	1,530	3,093
Average stream gradient in study section (%)	5	4	3	3
Average stream width in study section (m)[1]	4.9	5.2	1.5	1.8
Major materials composing streambed surface in study section[2]	cobble & boulder	cobble & boulder	pebble	pebble
Soil series in watershed[3]	Melbourne	Hugo	Hugo	Hugo
Mean annual precipitation (cm)[4]	203	102	127	127
Annual streamflow range liters/sec[5]	14.2–1,416	8.5–934	2.3–396	1.7–255

[1] Measured during minimum flow in summer.
[2] Wentworth's classification (Welch, 1948).
[3] Storie and Weir (1953).
[4] Durenberger (1960).
[5] Range observed during water quality sampling in 1968–69 (Kopperdahl, Burns, and Smith, 1971). Only South Fork Caspar Creek had a streamflow gage and its range exceeded that observed during water quality sampling. South Fork Caspar Creek generally reaches a maximum flow of about 1,189 liters/sec in the winter (Ziemer, Kojan, Thomas and Muller, 1966).

102 to 317 cm. Air temperatures are cooled by dense, recurrent fogs, with the mean maximum temperature in July being about 21 C (Durenberger, 1960). Soils in these drainages are predominately loam and moderately erodible. The combination of steep slopes, heavy rainfall, and erodible soils renders these watersheds unstable. The watersheds are forested with redwood (*Sequoia sempervirens*) and Douglas fir (*Pseudotsuga menziesii*).

Streamflows fluctuate seasonally, with freshets occurring from November to March, and intermittent flows are common in the headwaters during the summer. Minimum streamflows range from 1.7 to 14.2 liters/sec. These small streams are important spawning and nursery areas for coho (silver) salmon (*Oncorhynchus kisutch*), steelhead trout, and cutthroat trout (*Salmo clarki*). Sculpins (*Cottus* spp.) and threespine stickleback (*Gasterosteus aculeatus*) inhabit some of the streams. Coho salmon spawn from November through January. Young salmon emerge from the gravels from February through May and usually spend a year in the stream before emigrating to the ocean. Steelhead trout spawn from December to May. Their young emerge from April to June and remain in the stream from 1 to 4 years before emigrating to the ocean (Shapovalov and Taft, 1954). Cutthroat trout form both resident and anadromous populations in California streams from the Eel River north. Cutthroat trout spawn from October to May, and their young follow a stream life similar to that of rainbow trout (DeWitt, 1954). Fishing pressure on juvenile salmonids is negligible in these streams.

METHODS

Each stream was studied for three summers before, during, and after either logging or road building. This season was selected because it is a critical period for the survival of stream-dwelling salmonids. (Living space is limited by streamflow, water temperatures are highest, and most logging occurs in the summer.)

Streamflow and stream dimensions were measured systematically within each study stream section (Burns, 1971). Water quality was monitored periodically after logging, while stream temperatures were recorded each summer (Kopperdahl, Burns, and Smith, 1971). Spawning bed sedimentation was measured (Burns, 1970), using techniques similar to those of McNeil and Ahnell (1964). The

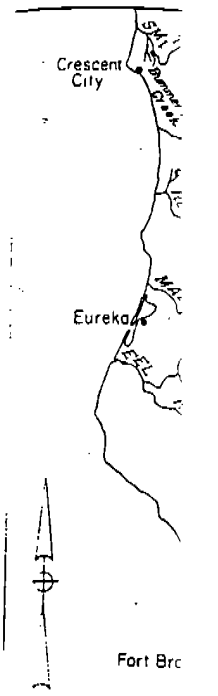

FIGURE 1.—Map showing the locati

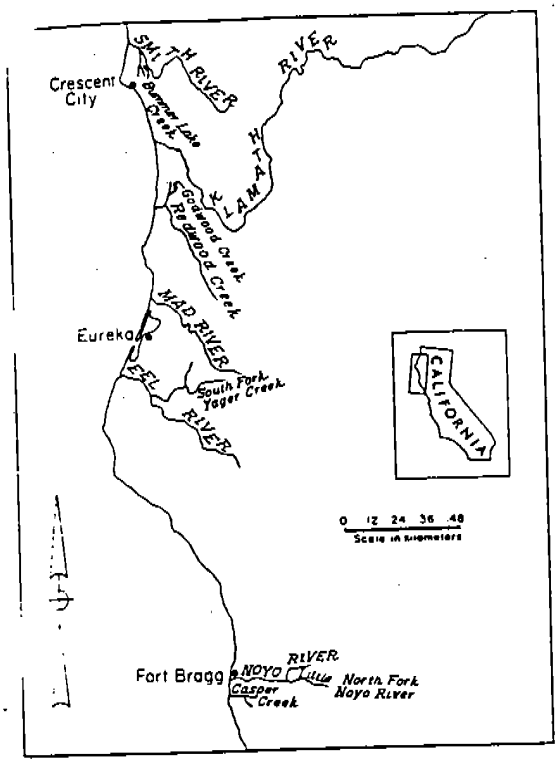

FIGURE 1.—Map of the northern California coast showing the location of study streams.

abundance of juvenile salmonids was estimated at selected times in the summers of 1966 to 1969 (Burns, 1971). Fish were captured with a battery-powered, DC, back-pack shocker and populations estimated by the Petersen single-census, mark-and-recovery method (Davis, 1964) or by the two-catch, removal method (Seber and LeCren, 1967). The abundance of fish food and the summer food habits of salmonids in South Fork Caspar Creek were determined (James Burns, John Brode, and Gary Smith, MS; Hess, 1969).

EFFECTS OF LOGGING AND ASSOCIATED ROAD BUILDING ON FOUR CALIFORNIA STREAMS

Bummer Lake Creek

Bummer Lake Creek flows through private lands into the Smith River system, near the California-Oregon border (Figure 1). A portion of its old growth forest was clear cut in alternate blocks on the southwest slope of the stream in the summer of 1968 (Figure 2): 58,000 m³ of redwood and Douglas fir timber were harvested from 110 ha. Logs were yarded by high lead away from the stream up to the road and by bulldozer above the road. The average horizontal distance between the stream and the road was 120 m, and there were no stream crossings. A bulldozer was operated in the streambed for the removal of logs and other debris from the 1,524-m study section.

Streamflow ranged from 14.8 to 34.5 liters/sec and stream surface area from 0.557 to 0.730 ha during the September surveys (Table 2). Water temperatures remained cool after the logging and never exceeded 18.3 C. In the clear cut blocks bordering the stream, water temperatures were 4.4 C higher than they were in the uncut section upstream. In the cut sections, stream temperatures increased 1.0 C/100 m. In the uncut block between the two cut blocks, stream temperatures cooled 0.5 C/100 m; thus, beyond this shaded area, temperatures were 2.2 C cooler. Water quality remained within limits tolerated by salmonids. No abnormal concentrations of oxygen, carbon dioxide, pH, alkalinity, chloride, sulfate, nitrate, phosphate, or tannin and lignin were detected (Kopperdahl *et al.*, 1971).

The mean percentage of spawning bed sediments smaller than 0.8 mm diameter increased from 10.2 to 13.3% after the logging (Burns, 1970), but the increase was not statistically significant at the 5% level (Student's t-test). The bulldozing of logging debris from the streambed did not fill in pools, erode the stream banks, or cause any adverse conditions. The slight increase in fine materials was probably due to erosion on the cut slopes. Apparently the wide stream channel and boulder-and-cobble bottom prevented the bulldozers from gouging the stream channel.

Fish populations were not adversely affected by the logging. The biomass of salmonids was slightly lower during the logging and increased after it (Table 3). The 19% increase in salmonid biomass to 49.2 kg/ha, however, was within the range of natural variation in unlogged California streams (Burns, 1971). Yearling and older trout were fewer after the logging, but young-of-the-year were more abundant. (Steelhead and cutthroat trout pop-

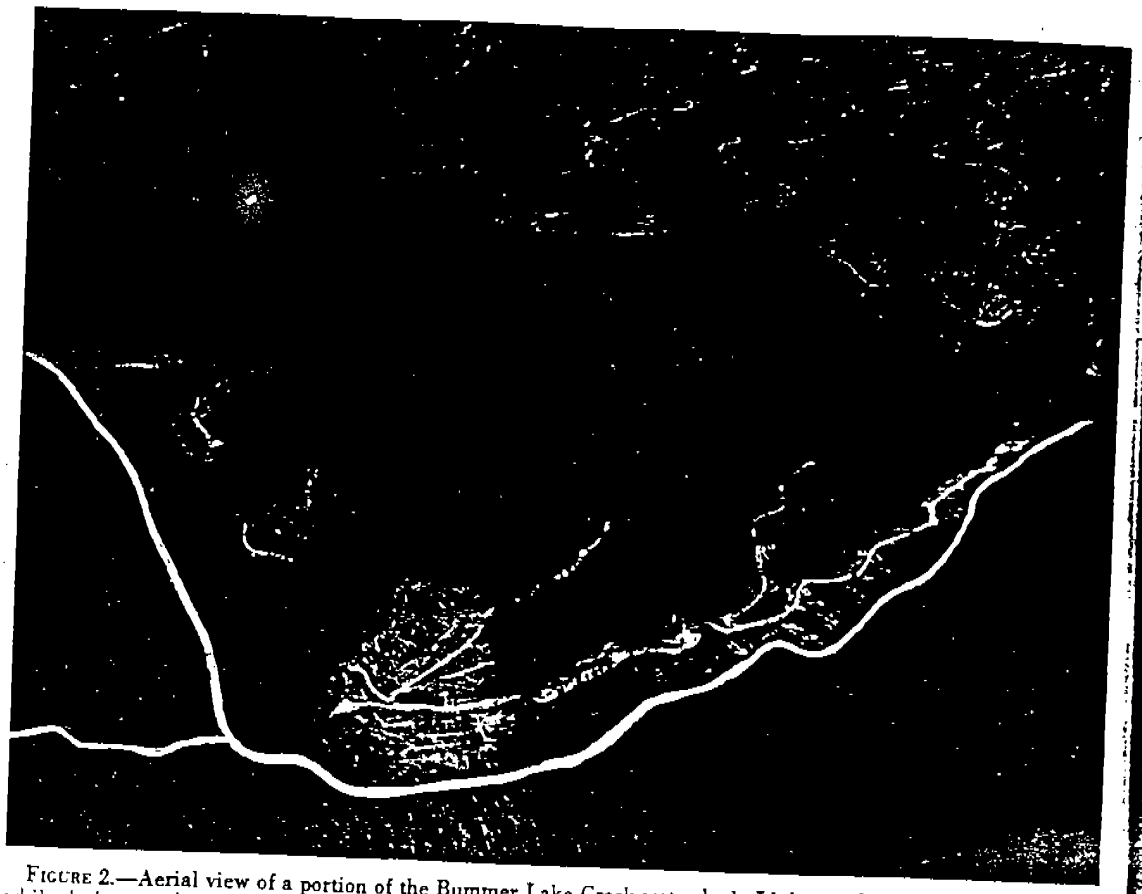

FIGURE 2.—Aerial view of a portion of the Bummer Lake Creek watershed. Light patches are clear cut blocks, while darker patches are uncut blocks. The white line represents the stream and its forks flowing west. The study section extends from the forks 1,524 m downstream through the second cut block.

TABLE 2.—*Dimensions of the Bummer Lake Creek study section during the September surveys*

Year	Condition	Streamflow (liters/sec)	Length (km)	Pool surface area (ha)	Riffle surface area (ha)	Volume (m^3)
1967	Unlogged	14.8	1.524	0.459	0.270	1,444
1968	Two months after logging	34.5	1.524	0.511	0.219	1,025
1969	Fourteen months after logging and 11 months after stream cleanup	17.0	1.524	0.340	0.217	764

TABLE 3.—*Population densities, mean fork lengths, and absolute numbers of salmonids in Bummer Lake Creek*

Survey date	Steelhead rainbow and coast cutthroat trout						Coho salmon		
	Young-of-the-year			Yearling and older					
	No./m^2 (kg/ha)	Mean fork length (mm)	Number[1]	No./m^2 (kg/ha)	Mean fork length (mm)	Number[1]	No./m^2 (kg/ha)	Mean fork length (mm)[1]	Number[1]
September 1967	0.82 (14.20)	55 (54–56)	4,509 (4109–4909)	0.14 (25.42)	112 (111–114)	1,003 (797–1209)	0.04 (1.54)	69 (67–71)	279 (221–336)
September 1968	0.39 (13.25)	64 (63–66)	3,916 (2698–5134)	0.10 (18.39)	113 (112–114)	720 (606–834)	0.15 (4.85)	63 (62–64)	1,124 (938–1323)
September 1969	0.93 (28.76)	62 (61–63)	5,175 (5018–5332)	0.08 (19.58)	130 (125–135)	430 (335–525)	0.02 (0.87)	70 (68–72)	111 (98–124)

[1] 95% confidence intervals in parentheses.

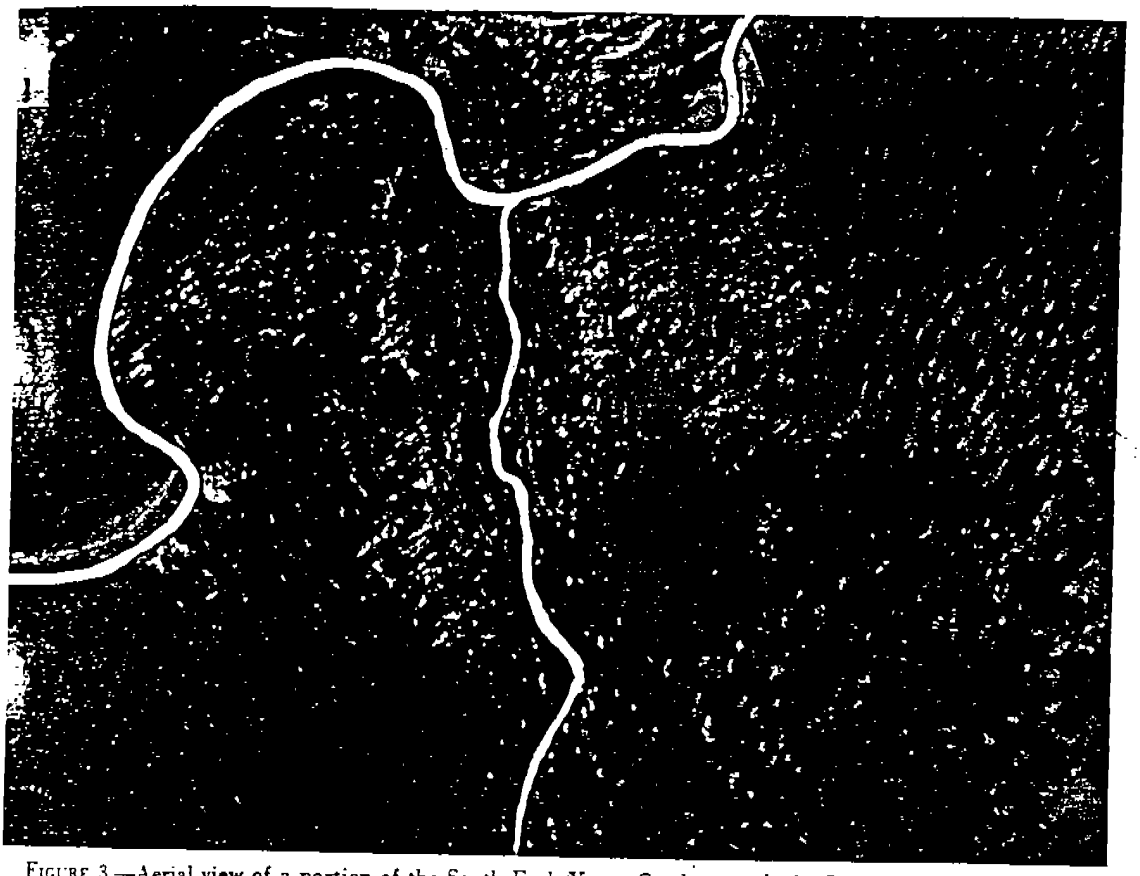

FIGURE 3.—Aerial view of a portion of the South Fork Yager Creek watershed. Center white line represents the stream flowing north to main Yager Creek. Black lines outline area of forest which was selectively logged. A buffer strip was left along the stream.

lations were pooled because of the difficulty in identifying juveniles in the field; of the older fish that could be identified, about 75% were cutthroat.) All age groups of trout had longer mean lengths after the logging. Coho salmon formed a marginal population in this stream and showed considerable population fluctuation. Their mean length did not change significantly after the logging. Sculpins also increased in biomass after the logging, from 1.3 kg/ha in 1967 to 6.2 in 1968 and 21.8 in 1969.

South Fork Yager Creek

South Fork Yager Creek flows through private lands into the Van Duzen-Eel River System, south of Eureka, California (Figure 1). Old growth timber was cut selectively in the summer of 1968 from the mouth of South Fork Yager Creek upstream 560 m and over an area of 305 m on each side of the stream (Figure 3). Eighty percent of the timber volume was cut from the original volume of 344 m^3/ha. Yarding was done with bull-

TABLE 1.—*Dimensions of the South Fork Yager Creek study section during the August surveys*

Year	Condition	Streamflow (liters/sec)	Length (km)	Pool surface area (ha)	Riffle surface area (ha)	Volume (m^3)
1967	Undisturbed	16.9	0.368	0.211	0.099	378
1968	Immediately after logging	14.9	0.566	0.152	0.119	372
1969	1 year after logging	20.4	0.566	0.251	0.075	446

TABLE 5.—*Population densities, mean fork lengths, and absolute numbers of steelhead rainbow trout in South Fork Yager Creek*

Survey date	Young-of-the-year			Yearling and older		
	Number/m² (kg/ha)	Mean fork length (mm)[1]	Number[1]	Number/m² (kg/ha)	Mean fork length (mm)[1]	Number[1]
August 1967	1.22 (13.38)	42 (41–43)	3,781 (3522–4040)	0.02 (4.08)	115 (101–129)	65 (25–103)
August 1968	1.08 (21.61)	58 (57–59)	2,932 (2838–3026)	0.04 (8.02)	118 (114–123)	116 (71–161)
August 1969	1.74 (22.60)	48 (47–49)	5,668 (5449–5886)	0.07 (13.46)	123 (120–126)	212 (157–267)

[1] 95% confidence intervals in parentheses.

dozers. Great care was taken to protect the stream during the logging. Riparian vegetation, including merchantable redwood and Douglas fir trees leaning toward the stream, was not cut, and heavy equipment did not enter the stream. Roads and landings were built away from the stream on low gradients.

Streamflow ranged from 14.9 to 20.4 liters/sec and stream surface area from 0.271 to 0.326 ha during the August surveys (Table 4). Water temperatures did not increase after the logging. Temperatures were high in all years, usually reaching 21.5 C in the summer. The protection of riparian vegetation along the stream prevented stream temperatures from increasing to lethal levels after the logging. No abnormalities in water quality were detected after the logging (Kopperdahl *et al.*, 1971).

The mean percentage of spawning bed sedi-

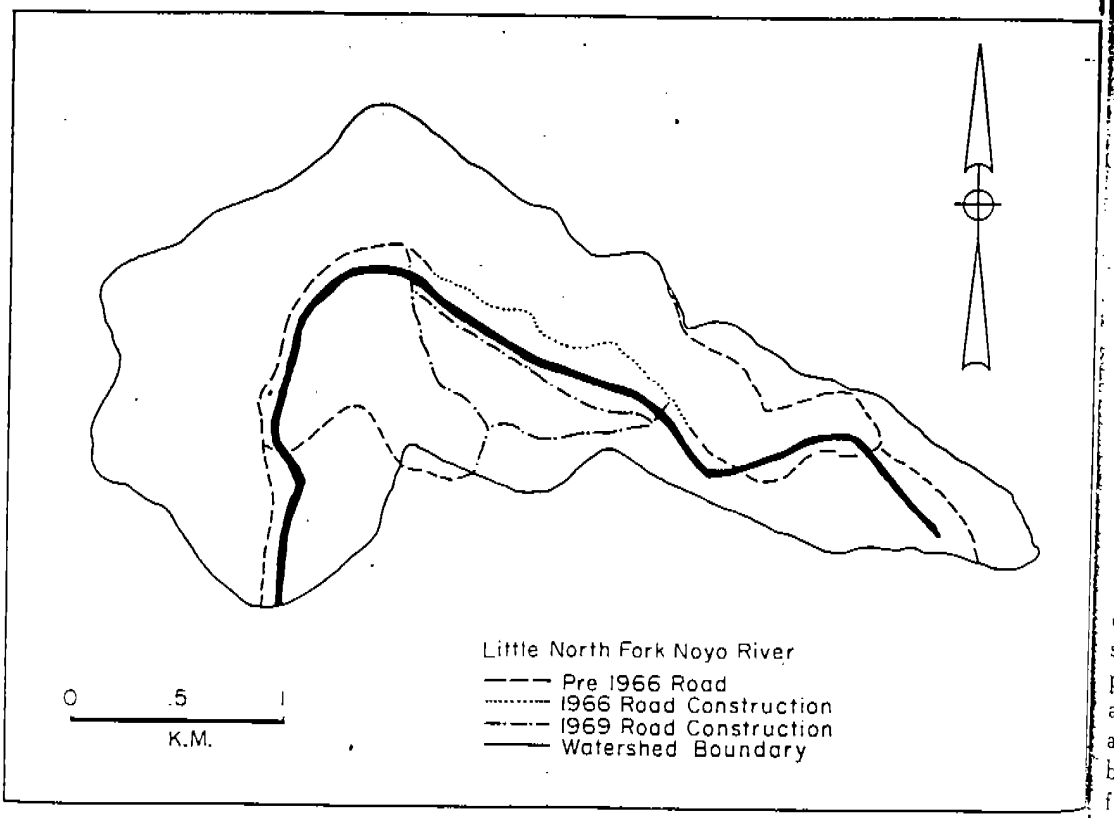

FIGURE 4.—Diagram of Little North Fork Noyo River road construction.

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FIGURE 5.—Little North Fork Noyo River received considerable alteration during road construction. The road on the right of the photograph was built in 1966, while the road at the top was built in 1969.

ments smaller than 0.8 mm diameter increased from 16.4 to 22.1% after the logging; however, this increase was not due to the logging but was due to the release of sediments from the collapse of a tree jam-and-rock barrier upstream from the study section (Burns, 1970).

Fish populations increased after the logging (Table 5). The biomass of all age groups of steelhead trout increased and their mean lengths were longer after the logging. The 106% increase in biomass of steelhead trout to 36.1 kg ha was greater than the natural range of fluctuation in unlogged streams. However, data from an upstream area indicates that this stream was not at carrying capacity during the prelogging population census (Burns, 1971) and, therefore, the entire increase cannot be attributed to the logging. Sculpin and stickleback populations decreased after the logging from 2.3 kg ha in 1967 to 0.9 in 1968 and 0.4 in 1969.

Little North Fork Noyo River

Little North Fork Noyo River flows through private lands into the Noyo River, near Fort Bragg, California (Figure 1). Its second-growth (logged 100 years ago) redwood and Douglas fir forest has been subjected to selective logging since 1964 (Figure 4). Thirty percent of the timber volume has been removed from 542 ha of watershed since 1966. A bulldozer worked in or near the 1,530-m study section during road construction and right-of-way logging in the fall of 1966 and in the spring of 1969 (Figure 5). Yarding was done with bulldozers. Average distance from the road to the stream was 23 m. There was one bridge crossing at the upper end of the study section.

Streamflow ranged from 2.2 to 7.3 liters/sec and stream surface area from 0.609 to 0.998 ha during the October surveys (Table

TABLE 6.—*Combined dimensions of the four study areas in Little Fork Noyo River during the October surveys*

Year	Condition	Streamflow (liters/sec)	Length (km)	Pool surface area (ha)	Riffle surface area (ha)	Volume (m^3)
1966	Pre-road construction	2.2	0.399	0.414	0.195	93
1968	Twenty-four months after initial road construction and 12 months after gully logging	5.4	0.399	0.619	0.379	122
1969	Immediately after second road construction	7.3	0.424	0.547	0.447	91

6). The selective removal of timber along the stream opened the forest canopy and undoubtedly increased stream temperatures; however, instrument damage and malfunctions prevented collection of stream temperature data before the road construction. Temperatures after the road construction and logging, however, did not exceed 21.1 C. No abnormalities in water quality were detected after the logging (Kopperdahl *et al.*, 1971).

Bulldozer activities increased stream turbidity and spawning bed sediments. After a light rain in November 1969, turbidity reached 53 J. T. U. (Kopperdahl *et al.*, 1971). Two years after the construction of an all-weather road adjacent to the stream, the mean percentage of sediments smaller than 0.8 mm had increased from 20.0 to 31.0% (Burns, 1970). After a second road had been constructed on the other side of the stream and the streamside selectively logged, sediments smaller than 0.8 mm increased to 33.3%. These increases were statistically significant at the 5% significance level (Student's t-test). The pebbles and small gravel composing the narrow stream channel were easily gouged, leaving a heavily silted streambed, with the stream flowing along two bulldozer tracks (Figure 6).

Fish populations decreased as watershed and stream disturbances progressed on Little North Fork Noyo River (Table 7). Steelhead trout numbers remained about the same, but the trout were smaller after the logging, and consequently their biomass decreased 42%. The numbers and biomass of coho salmon decreased more markedly. Biomass decreased 65%, even though the average weight of coho salmon increased as population densities decreased. The total biomass of salmonids decreased 62% to 9.3 kg/ha and this decrease was greater than that of unlogged streams (Burns, 1971). Sculpin abundance decreased each time the streambed became heavily silted, but the sculpins were quick to recover. Before the road construction there were 1.6 kg/ha, and 24 months after road construction there were 11.6 kg/ha. Immediately after the 1969 stream disturbances, the sculpin population was down to 0.4 kg/ha.

South Fork Caspar Creek

Caspar Creek, which flows through Jackson State Forest just south of Fort Bragg, received

FIGURE 6.—After a bulldozer operated in the streambed of Little North Fork Noyo River, the streamflow split into two separate channels, each formed by bulldozer tracks.

TABLE 7.—*Population densities, mean weights, and absolute numbers of salmonids in Little North Fork Noyo River*

Survey date	Steelhead rainbow trout			Coho salmon		
	Number/m² (kg/ha)	Mean weight (g)[1]	Number[1]	Number/m² (kg/ha)	Mean weight (g)[1]	Number[1]
October 1966	0.03 (3.66)	11.8	19 (11–27)	1.15 (20.70)	1.8	698 (672–724)
October 1968	0.03 (1.73)	6.0 (4.8–7.2)	29 (23–35)	0.40 (9.66)	2.4 (2.2–2.6)	403 (390–416)
October 1969	0.03 (2.14)	8.6 (5.6–11.5)	25 (24–26)	0.26 (7.15)	2.8 (2.5–3.0)	255 (238–272)

[1] 95% confidence intervals in parentheses.

more attention than the other study streams ce there was an interagency program (U. S. est Service, California Division of Forestry, California Department of Water Resources, Humboldt State College, and California Department of Fish and Game) to determine the effects of road construction on streamflow, sedimentation, fish life, and fish habitat (U. S. Forest Service, 1965).

The South Fork's second-growth forest of redwood and Douglas fir was disturbed by 6.0 km of road construction in the summer of 1967 (Figure 7). Nineteen thousand-four hundred m of sawlogs were harvested and 18,800 m³ of road materials moved during the road right-of-way construction. The road was built adjacent to the stream, ranging from four bridge crossings (Figure 8) to 76 m at the furthest point from the stream. Road materials were side-cast into a portion of the stream and 79 m of the stream were relocated.

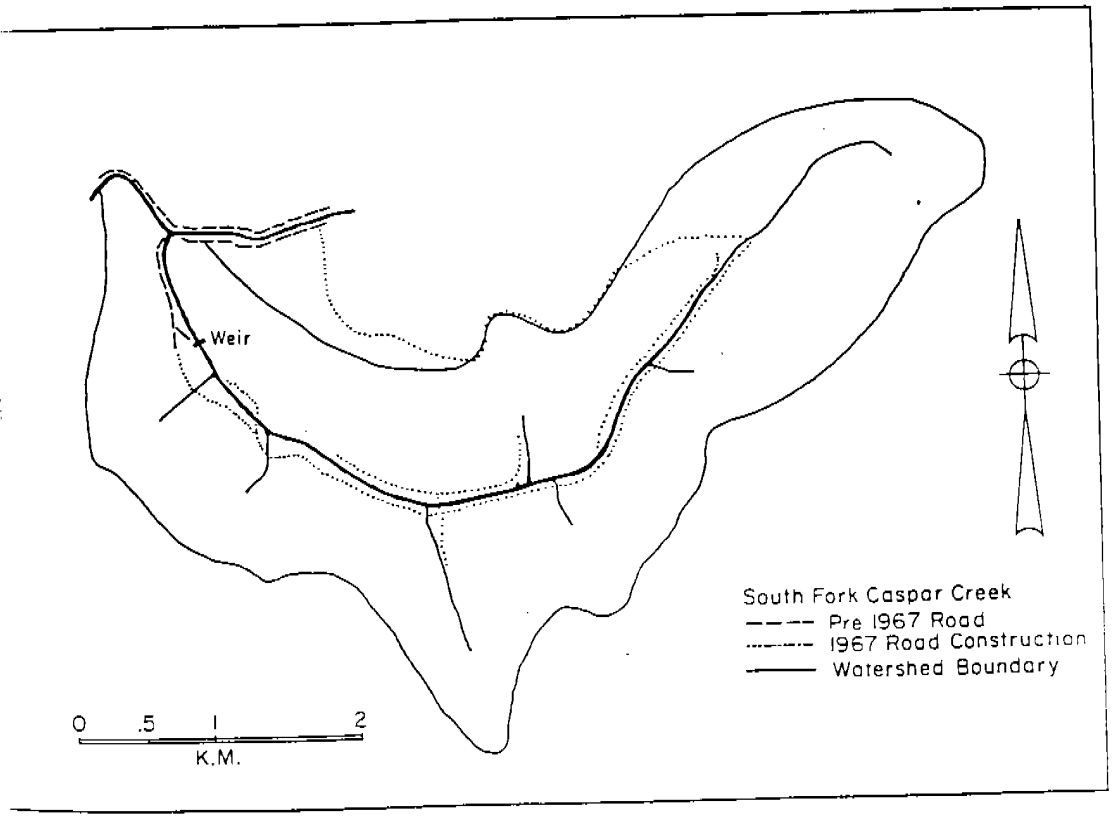


FIGURE 7.—Diagram of South Fork Caspar Creek road construction.

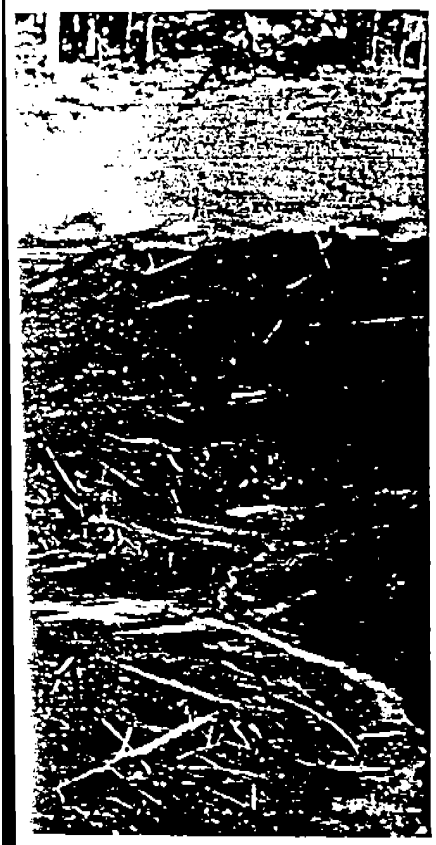
FIGURE 8.—South Fork Caspar Creek, showing one of the four bridge crossings and the stream disturbance resulting from bridge construction.

A bulldozer operated through 41% of the 3.093-m study section during the yarding of logs and the removal of debris. Most of the fill slopes, secondary roads, and streambank were fertilized with urea and seeded with annual rye grass (*Elymus* sp.) at a rate of 56 kg/ha. No logging trucks used the road after the first summer. Road slides occurred during

TABLE 8.—*Dimensions of the South Fork Caspar Creek study section during the June and October surveys*

Year	Condition	Streamflow (liters/sec)	Length[1] (km)	Pool surface area (ha)	Riffle surface area (ha)	Volume (m^3)
June 1967	Pre-road construction	12.7	3.091	0.295	0.507	367
October 1967	Immediately after road construction	4.6	2.896	0.193	0.301	226
June 1968	Eight months after road completion	8.0	3.039	0.290	0.210	305
October 1968	Twelve months after road completion	2.3	2.723	0.216	0.193	186
June 1969	Twenty-two months after road completion	12.8	3.031	0.367	0.283	400
October 1969	Twenty-three months after road completion	5.1	2.887	0.234	0.162	234

[1] Variable length due to intermittent flow drying some stream sections.



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ing trucks used the road after the
r. Road slides occurred during

during the June and October surveys

surface (ha)	Riffle surface area (ha)	Volume (m^3)
295	0.307	367
193	0.301	226
290	0.210	305
216	0.191	186
[illegible]	[illegible]	400
[illegible]	[illegible]	234

the winter and road repair was necessary in the springs of 1968 and 1969.

Streamflow ranged from 12.8 to 2.3 liters/sec and stream surface area from 0.656 to 0.396 ha during the June and October surveys (Table 8). Prior to the road construction, the amount of solar radiation received at some stations along the stream was less than 5% of the total available at that latitude. Even on clear days, about half of the stream received less than 10% of the available radiation because of the dense streamside vegetative canopy. Absolute values ranged from 7 to 276 langleys/day (DeWitt, 1968). After the road construction some stations along the South Fork received 140% more radiation than they had previously. The absolute average increased 98 langleys/day. Increased solar radiation increased stream temperatures. Water temperatures increased as much as 11.1 C during the road construction at some South Fork stations (Hess. 1969). The maximum observed temperature was 25.3 C (DeWitt, 1968). The maximum preconstruction temperature at the downstream end of the study section was 13.9 C (Kabel and German. 1967), while the postconstruction maximum for this station was 21.1 C.

During the logging, dissolved oxygen dropped to 5 ppm in some isolated pools with decaying slash, while undisturbed stream sections had 10 ppm (Richard Brandon, Humboldt State College, pers. comm.). In August 1968, 11 months after cessation of the right-of-way logging, the concentration of carbon dioxide was 8 ppm (Kopperdahl *et al.*, 1971). However, this level of carbon dioxide is not lethal to salmonids (McKee and Wolf, 1963). The increase in carbon dioxide probably resulted from decomposition of logging slash in the streambed. Unlogged streams on the coast had concentrations of carbon dioxide of less than 2 ppm during this same period (Kopperdahl *et al.*, 1971). Other concentrations of chemicals within South Fork Caspar Creek were generally normal.

High turbidities were localized in areas where a bulldozer was working in the stream during bridge construction. Silt extended only a short distance downstream from the disturbance and the stream cleared quickly upon cessation of bulldozer activities. During a moderately heavy rainfall in the first winter after road construction, erosion and slippage of the road caused turbidities of 3,000 ppm and deposition of as much as 0.6 m of sediment in the stream (Hess, 1969). The volume of sediments smaller than 0.8 mm increased from 20.6 to 34.2% immediately after road construction. The next summer this class of sediments returned to the predisturbance level. Twenty-two months later, however, this class of sediments was up to 28.5%. These changes in streambed composition were statistically significant at the 5% significance level. The initial increase in 1967 followed extensive use of a bulldozer to clear the stream of logging debris (Figure 9). The narrow streambed composed of small materials was particularly susceptible to degradation. Erosion was lessened the first winter and spring by planting annual rye grass on the stream banks, fill slopes, and skid trails. Without excessive erosion, accumulated sediments were scoured from the riffles by the summer 1968. The increase in 1969 resulted from erosion of the streambank, side casts, and slides.

The road construction and right-of-way logging were immediately detrimental to most aquatic invertebrates in South Fork Caspar Creek, although conditions favored Diptera and Plecoptera (J. W. Burns, J. M. Brode, and G. E. Smith, MS). Increases in these two orders offset the losses in other invertebrates, causing an increase in benthos from 286 mg/m^2 to 634 mg/m^2 (120% increase) immediately after the road construction and fertilization with 817 kg urea. North Fork Caspar Creek (an unlogged, second-growth stream used as one of the controls for this study) also showed a 120% increase in benthos; therefore, the immediate increase in the South Fork cannot be interpreted as being caused by the road construction and fertilization (J. W. Burns, J. M. Brode, and G. E. Smith, MS). Recolonization of the South Fork was rapid and, within two years, the South Fork's benthos increased 370% over the preroad construction biomass. The North Fork's benthos increased only 64% during the same period (J. W. Burns, J. M. Brode, and G. E. Smith, MS). Ephemeroptera took longer to recover

FIGURE 9.—South Fork Caspar Creek was grossly altered by road construction. The primary cause of damage was the operation of bulldozers in the stream channel.

than did most other insect orders. Trichoptera recovered rapidly and along with Plecoptera and Diptera made up the majority of the South Fork's benthos. Trichoptera drift increased more than drift of other orders after the road construction. The occurrence of terrestrial organisms in the drift appeared to be influenced only slightly by the disturbance. The total drift increased 47% by the first spring after the road construction and 100%

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TABLE 9.—*Population densities, mean fork lengths, and absolute numbers of salmonids in South Fork Caspar Creek*

Survey date	Steelhead rainbow trout: Young-of-the-year No./m² (kg/ha)	Young-of-the-year Mean fork length (mm)[1]	Young-of-the-year Number[1]	Yearling and older No./m² (kg/ha)	Yearling and older Mean fork length (mm)[1]	Yearling and older Number[1]	Coho salmon No./m² (kg/ha)	Coho salmon Mean fork length (mm)[1]	Coho salmon Number[1]
June 1967	1.69 (11.81)	37 (36–38)	10,183 (9507–10859)	0.11 (10.26)	86 (78–93)	673 (362–984)	1.00 (15.90)	47 (45–48)	6,001 (5613–6389)
October 1967	0.29 (4.94)	50 (48–52)	1,436 (1313–1559)	0.02 (4.53)	124 (112–135)	106 (95–117)	0.21 (5.45)	58 (56–60)	1,038 (962–1114)
June 1968	1.32 (10.51)	43 (42–44)	6,580 (6473–6687)	0.04 (3.65)	95 (92–99)	176 (141–211)	0.50 (7.42)	49 (48–50)	2,510 (2452–2568)
October 1968	0.58 (12.77)	58 (57–59)	2,363 (2307–2419)	0.01 (2.13)	115 (108–122)	51 (33–69)	0.32 (5.78)	54 (53–55)	1,283 (1244–1322)
[illegible]	1.45 (17.38)	47 (46–48)	9,512 (9238–9786)	0.06 (5.70)	92 (89–94)	407 (303–511)	0.77 (11.62)	51 (50–52)	5,036 (4833–5239)
October 1969	0.81 (17.07)	57 (56–58)	3,224 (3153–3295)	0.04 (5.23)	111 (107–113)	141 (91–191)	0.48 (8.08)	54 (53–55)	1,885 (1849–1921)

[1] 95% confidence intervals in parentheses.

by the second spring. The weight of insects dropping into the South Fork doubled over the preroad construction values (Hess, 1969). The greatest increase was in those having aquatic immature stages, the increase being exceptional in Trichoptera and Diptera. Aquatic organisms were more important in the diets of steelhead trout and coho salmon than were terrestrial organisms. Diptera became more important in the diets of South Fork salmonids after the road construction.

Salmonid populations decreased immediately after the road construction (Table 9). Recovery began the following spring and by the second spring the salmonid biomass was only 20% lower than the predisturbance biomass of 38.0 kg/ha. All age groups of salmonids had greater mean lengths after the road construction. The road construction may have reduced the total yield of coho salmon and steelhead trout smolts in 1968 and 1969, because of high mortality of both species and the premature emigration of yearling and older steelhead trout in 1968 (Graves and Burns, 1970). Population changes in the summer (June to October) were highest in 1967, when the road was built into the South Fork's watershed. The population of young-of-the-year (Age +) steelhead trout decreased 85%, older (Age 1+) steelhead trout decreased 84%, and coho salmon decreased 82%. These rates were much higher than the average decreases of 65% for Age + steelhead trout, 68% for Age 1+ steelhead trout, and 55% for coho salmon in 1968 and 1969. The oversummer loss of South Fork salmonids was also higher than the decrease observed for the same period in North Fork Caspar Creek. In the summer of 1967, these were 69, 25, and 16% for the respective species and age groups in the North Fork (Burns, 1971). Some of the decrease in the South Fork in 1967 may have resulted from emigration of some large steelhead trout from the study area to the pools formed behind the streamflow gaging and fish trapping facilities. Downstream migrant census data for the spring of 1968 suggest that these pools provided refuge for a few fish during road construction (Graves and Burns, 1970). In the strict sense, then, not all of the decrease was mortality. In 1968 downstream migrants in both the North and South Forks were monitored from June to October. Only young-of-the-year fish entered the traps, with 6 steelhead trout and three coho salmon trapped in both forks. These data suggest that few fish normally migrate downstream in Caspar Creek during the summer. The combined smolt yield of steelhead trout and coho salmon in the South Fork for the spring of 1968 was 20% lower than the preroad construction smolt yield, but was within the range of other California streams (Graves and Burns, 1970). Stickleback biomass fluctuated widely during the study, showing an overall increase after the road construction. June and October biomasses were: 0.2 to 0.7 kg/ha in 1967, 6.6 to 2.5 in 1968, and 1.1 to 5.0 in 1969.

DISCUSSION

Studies of the effects of logging reported from California, Alaska (Sheridan and McNeil, 1968; Meehan, Farr, Bishop, and Patric, 1969), and Oregon (Hall and Lantz, 1969) suggest that logging is compatible with anadromous fish production if adequate attention is given to stream and watershed protection and channel clearance. Under special circumstances, stream salmonid production can even be enhanced by logging. Cold streams, shaded by dense forest canopies are not optimum trout habitats (White and Brynildson, 1967). Thinning the riparian canopy allows a greater total solar radiation to reach the stream, raising temperatures a few degrees (viz., Bummer Lake Creek), and increasing the production of bacteria, algae, and the insects upon which fish feed (viz., South Fork Caspar Creek). Salmonid biomass increased in two California streams (Bummer Lake Creek and South Fork Yager Creek) after the streams were carefully logged.

Temperature increases can be predicted and modified by leaving shade along the stream (Brown, 1969). A dense understory or buffer strip (e.g., South Fork Yager Creek) can effectively keep temperatures cool. Alternating cut and uncut sections (e.g., Bummer Lake Creek) can be used to control temperatures. Increases are at least partially reversible if the warmed water passes through shaded areas.

Logging often results in higher summer streamflow (Rothacher, 1965; Hibbert, 1967), providing more living area for juvenile salmonids and thereby increasing the fish rearing capacity of the stream. If protective logging is compatible with fish production, then what logging activities are incompatible or need special attention? Chapman (1962) reviewed many of the effects of logging on fishery resources; many of his points are reviewed here and others observed in this study and in Oregon (Hall and Lantz, 1969) are discussed.

Removing too much of the forest canopy, such as cutting all or a major portion of a watershed, can have drastic results for salmonids. Warmed waters entering the main stream from several logged tributaries may increase main stream temperatures beyond those tolerated by salmonids. Temperatures above 25 C for extended periods are usually lethal to salmonids (Brett, 1952). Streams can reach lethal temperatures or, more commonly, levels which increase metabolic rates and maintenance requirements, increase pathogenic activity, and decrease the solubility of oxygen. These dangers are even more critical inland, away from cooling influences of coastal fog. Temperatures of California streams within the coastal fog belt did not exceed 21 C for extended periods. Trout production in some sections of Berry Creek, Oregon, was not increased by removing the forest canopy, even though the amount of solar radiation reaching the cleared sections was triple that reaching the shaded sections. Algal production was much higher in the cleared sections; however, this increase was offset by decreases in terrestrial plant debris available for insect foods (Warren, Wales, Davis, and Doudoroff, 1964). Terrestrial detritus and leaf fragments are apparently more important as food to insects eaten by coho salmon than are aquatic plants (Chapman and Demory, 1963).

Extensive use of bulldozers on steep slopes or in stream channels can cause excessive erosion which can be deleterious to salmonid reproduction. Small streams with narrow channels seem most vulnerable to this type of damage. The mean volumes of streambed sediments smaller than 0.8 mm in Little North Fork Noyo River and South Fork Caspar Creek exceeded 30% during the logging but probably were less during the salmon and steelhead spawning periods (Burns, 1970). Had fine sediments remained this abundant after the spawning, salmonid survival to emergence would probably have averaged less than 10% (Hall and Lantz, 1969). Building roads away from the stream (viz., Bummer Lake Creek), or leaving a buffer strip (viz., South Fork Yager Creek) to intercept sediments and slash protects the stream habitat. Seeding the disturbed areas with grass (viz., South Fork Caspar Creek) mitigates the damage. Streambed compaction which prevents the digging of redds or impairs the emergence of fry was not observed in the California streams studied, but has been observed in other California streams.

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Excessive erosion from logging frequently fills pools necessary for the rearing of larger salmonids (Fisk, Gerstung, Hansen, and Thomas, 6). Pools filled with sediment in Little ...th Fork Noyo River and South Fork Caspar Creek were scoured during each winter after the road construction and logging, thus providing adequate living space the following year. However, both streams built up numerous sediment bars, thus forming unstable streambeds with considerable gravel movement during periods of high streamflow. Extensive streambed movement is not unusual for Cali...ia streams. For example, in unlogged ...th Fork Caspar Creek as much as 2.3 m^3 of sediment per hectare of watershed has been deposited behind the streamflow gaging weir in a single year (Jay S. Krammes, U. S. Forest Service, pers. comm.). After road construction, the greatest amount of sediment deposited behind the South Fork Caspar Creek weir in one year was 0.7 m^3/ha.

Logging often results in higher peak stream...s and more rapid attainment of peaks ...ibbert, 1967). High flows accompanying a large deposition of sediments from side slope and streambank erosion will cause a great deal of streambed movement and stream turbidity. Streambed movement can crush and dislodge developing salmonid embryos and fry (James, 1956). Excessive turbidity is especially condemned by fishermen, since it limits their fishing days.

Another important consideration is the time of year when the logging occurs. Felling trees into the stream when embryos and fry are in the gravel is deleterious, since decaying slash depletes intragravel dissolved oxygen (Hall and Lantz, 1969) or produces copious amounts of slime bacteria (*Sphaerotilus*) which suffocate developing eggs and alevins (Gordon and Martens, 1969). This emphasizes the importance of keeping excessive amounts of slash out of streams. Because most of this slash was removed after the logging, dissolved oxygen concentrations in the California streams studied were generally at saturation. The most desirable practice is to keep all timber out of the stream. In my investigations, the major reason bulldozers entered stream channels was to remove logging debris. Another reason for keeping timber out of streams is to prevent the continual formation of log jams. Few loggers remove all trees, limbs, and other debris to above the high water level. Usually streams have to be cleared after each winter, since high water washes materials back into the stream, where they accumulate and form new barriers to fish migration.

Sustained logging and associated road construction over a period of many years do not afford either the stream or the fish population a chance to recover. Logging operations on the California streams studied were usually limited to one season and to only a small fraction of the total watershed. Had the watersheds been more extensively logged, changes may have been more severe. Prolonged disturbances (viz., Little North Fork Noyo River) damage stream habitat and fish populations. Logging operations should be completed in the shortest time possible and then the watershed left to recover. South Fork Caspar Creek recovered quite rapidly from extensive stream damage, although recovery may have been accelerated by streamside fertilization and seeding and by scheduling the major logging operation after the stream had recovered from the road construction. My studies and those in Oregon demonstrate that coho salmon and steelhead trout are resilient fish, able to compensate for adversities. Generally, the yields of downstream migrants were not drastically reduced and juvenile populations recovered rapidly. In a clear cut operation in a Douglas fir watershed in Oregon, the numbers of juvenile coho emigrating to the ocean during the two years after the logging were within the range of variation recorded before the logging (Hall and Lantz, 1969). Some fish killed in the summer during the logging would die during this period, anyway. In the summer, when populations are large and mortality is great, the impact of logging is not as severe as it is in the period following population adjustment to stream carrying capacity. In the fall and spring, when smolts are preparing for their downstream migration, the added mortality caused by logging could have serious consequences. The loss of yearling and older fish killed during this period would have a direct

effect upon smolt yields. In some of the California streams studied (Bummer Lake Creek and South Fork Caspar Creek), there were fewer yearling and older trout after the logging. The impact of this decrease on smolt yields is not well understood since the loss of older trout may be mitigated by the increased growth and survival of the remaining fish. However, it is known that the larger, older smolts have the highest ocean survival (Shapovalov and Taft, 1954). The prime objective of protecting anadromous fish streams from adverse watershed use is to maintain the quality and quantity of smolts entering the ocean. A secondary objective is to maintain water clarity, so that anglers can effectively fish for adults.

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Ancient redwoods and the politics of finance: the hostile takeover of the Pacific Lumber Company

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Ancient redwoods and the politics of finance: the hostile takeover of the Pacific Lumber Company

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Abstract

Pacific Lumber was acquired in 1986 by MAXXAM, whose decision to double PL's harvest of old-growth redwoods precipitated 11 years of environmental protests. Intense media coverage blames the Drexel-financed takeover for threatening Headwaters Forest, the largest privately owned ancient redwood forest. This 'Wall Street greed' portrayal aroused such public outrage that the Clinton administration agreed to pay $380 million for Headwaters weeks before the 1996 election. We establish that the threat to Headwaters is not attributable to MAXXAM's junk bond-financed takeover. Government's response to dramatic crises encourages interest groups to use emotional appeals to influence resource allocation. © 1998 Published by Elsevier Science S.A. All rights reserved.

Keywords: Takeovers; Junk bonds; Politics of finance; Environmental economics

JEL classification: G34; D23

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Magnificent, ancient redwoods, once carefully harvested jewels in the Pacific Lumber Company's crown, have become expendable pawns in a game of leveraged buyout and corporate greed.

California's Chain Saw Massacre
Reader's Digest, November 1989

It was a deal that summed up the decade.

Milken, Junk Bonds and Raping Redwoods
Rolling Stone, August 1989

1. Introduction

In the environmentally conscious 1990s, after 11 years of intense media attention, MAXXAM Group's Drexel-financed hostile takeover of the Pacific Lumber Company (PL) has become one of the most controversial acquisitions of the 1980s. The controversy was precipitated by MAXXAM's decision to double the timber harvest at PL, the largest private owner of old-growth redwoods. MAXXAM's action sparked a massive outcry from environmental groups ranging from the moderate Sierra Club to the radical Earth First!, whose methods include dramatic civil disobedience such as 'tree sit-ins', and neo-Luddite tactics such as sabotage of logging equipment and threats to spike trees with metal rods that seriously endanger timber workers. Earth First! activists illegally 'explored' PL's property to assess the extent of the threatened old growth where in 1987 they discovered the 3000-acre Headwaters Forest, previously unknown to the general public and the largest remaining ancient redwood forest in private hands. Environmentalists have since waged an intense and unrelenting campaign to save this tract.

Environmental protests, especially the dramatic actions of Earth First!, have garnered PL a decade of negative media coverage in such high visibility outlets as *Time*, *Newsweek*, *U.S. News and World Report*, *People*, the *New York Times*, and the *Washington Post*, as well as on television programs such as the CBS Evening News, 60 Minutes, 20/20, and the MacNeil/Lehrer News Hour. The media universally blame MAXXAM's junk bond-financed takeover for the threat to Headwaters Forest, and the sheer number of seemingly independent stories offering essentially the same interpretation lends credence to this view. The media tell a gripping tale of Wall Street greed versus the environment that pits an evil corporate raider against environmentalists and a paternalistic former management. The broad readership appeal of this story gave environmentalists a powerful case to mobilize public opinion in favor of preserving Headwaters Forest. Its apparent evidence of the destructive environmental impact of Wall Street greed prompted politicians to hold hearings that appealed to the environmentally conscious voter of the 1990s. The resultant crisis was 'solved' by the Clinton administration and the State of California just weeks before the November 1996 election by a preliminary agreement that provides for the public purchase of Headwaters Forest for cash and land valued at $380 million.

Adverse media coverage has made Pacific Lumber perhaps 'the' signature case which establishes for many people the destructive impact of Wall Street greed. It is therefore an important case to study to understand the process through which the general public came to hold such negative views of Wall Street in the wake of the 1980s takeover wave (see, e.g., Jensen, 1991, 1993). The PL case also shows how society sometimes allocates property rights and resolves externality conflicts not through the rational weighing of social costs and benefits, but via a media-dominated perceptions game in which interested parties compete for public attention by developing crisis-oriented stories that dramatize their cause. Politicians attempted to solve this particular crisis by formulating proposals to save Headwaters Forest without considering the opportunity cost of this action or understanding the real reason *why* Headwaters was threatened.

The real economic threat to Headwaters Forest reflects the fact that profit-motivated timber managers have immediate incentives to harvest old growth because *these trees no longer grow*. This statement applies to MAXXAM and it also applies to PL's old management which, we find, was systematically logging virgin forests the size of Headwaters every 2.5 years. At that rate, all PL's virgin redwood forests would have been logged by the year 1999, only a few years later than they would be logged under MAXXAM (the small difference in the two harvest strategies reflects the fact that PL had already logged more than 91% of its virgin forests before the takeover). The entirely predictable result is the eventual disappearance of *all* old-growth redwoods. Consistent with this prediction, fewer than 5% of America's original redwood forests remain unlogged today, of which the vast majority (92.1%) are the 81,500 acres preserved in public parks. The logging of more than 95% of America's virgin redwood forests over a 150-year period by numerous firms simply cannot be attributable to junk bonds or to hostile takeovers, which are relatively recent phenomena, let alone to the 1986 takeover of one particular firm.

Given these facts, why did the media uniformly blame MAXXAM's takeover for the threat to Headwaters Forest? The story apparently originated with environmentalists who, because they did not have the resources to purchase the trees they hoped to save, appealed to the media in hopes of gaining the necessary public support for a collective purchase. According to our sources, environmentalists were able to attract media attention to the simple, dramatic case of Wall Street greed versus the environment, and not to a more complex, less emotional treatment of the property rights issues. The Wall Street greed interpretation is believable to the general public, moreover, as it is broadly consistent with the facts of the case: MAXXAM had recently acquired PL in a Drexel/Milken-financed hostile takeover and was in fact radically increasing PL's timber harvest. Politicians were attracted to the case because of concurrent

public interest in the government's case against Ivan Boesky, Drexel, and Michael Milken, all of whom were involved to some degree in MAXXAM's takeover of Pacific Lumber.

Once the Wall Street greed interpretation became accepted wisdom, no group – not environmentalists seeking to save the trees, not journalists seeking to attract readers, not politicians seeking to attract votes – had incentives to ferret out and publicize the real economic threat to Headwaters Forest. In fact, some politicians and environmentalists used the media portrayal of MAXXAM CEO Charles Hurwitz as evil corporate raider to marshal public support for proposals to confiscate Headwaters without compensation, or at least to pay substantially less than the timber value of this land. And because Headwaters was the centerpiece of environmentalists' campaign to save the redwoods/ancient forests, the Clinton administration and other politicians focused on saving this particular grove, giving little or no consideration to the social opportunity costs of this action.

Section 6 of the paper describes in more detail how politicians and environmentalists dealt with the property rights issues and externality conflicts entailed in preserving Headwaters Forest. Section 2 reports key events in the Pacific Lumber takeover and its aftermath, while Section 3 describes the media version of the PL story and how that story was disseminated to a national audience. Section 4 describes the real economic threat to the ancient redwoods, and provides evidence that both MAXXAM and PL's prior management would have logged all PL's virgin forests (with MAXXAM planning to do so only a few years sooner). Section 5 discusses other misleading aspects of the media version of the PL story, and contrasts that version with the facts in the case. Section 7 concludes with a brief summary.

2. The Pacific Lumber takeover and its aftermath: key events[1]

When The Pacific Lumber Company was originally incorporated in 1869, its assets consisted of 6,000 acres of timberland in Humboldt County, California. PL began logging in 1886 after acquiring more acreage, arranging shipping and rail transportation, and constructing a mill capable of processing the large logs of old-growth redwood in Scotia, the company-owned town near Eureka. PL was acquired by Simon Jones Murphy in 1903–1905, and its shares were publicly traded since at least the 1920s. PL's business expanded rapidly after 1914, when rail connections were established between Eureka and San Francisco, 300 miles to the south. At year-end 1984, PL owned 193,000 acres of timberland (carried on the books at $177 per acre), three sawmills, the town of Scotia, PL's San Francisco headquarters, a cutting and welding business, and 3,400 acres of farmland.

[1] Sources for this section include SEC filings for Pacific Lumber, MAXXAM, and its predecessor MCO Holdings, newspaper and magazine articles on these firms and on Charles Hurwitz, and Freeman (1967), Amodio (1980), Dewitt (1993), Schrepfer (1983), Hewes (1993), Rohde and Rohde (1994), and Harris (1995).

At the time of MAXXAM's 1985 hostile bid, PL was – as it remains today – the largest private owner of old-growth redwood trees.[2] According to PL's current CEO, John A. Campbell, in 1987 PL owned 75% of the old-growth redwoods outside state and federal parks (California State Legislature, 1987, p. 30). In 1992, PL accounted for 57% of total industry shipments of upper-grade redwood lumber and 26% of redwood lumber of all grades (Salomon Brothers, 1993, p. 3). Simon Jones Murphy and his descendants managed the company from 1903 until 1972, when CEO Stanwood A. Murphy died suddenly of a heart attack. Because Stanwood Murphy's two sons were too young to run the company, succession fell to non-family managers. When MAXXAM made its offer, PL's CEO was Gene G. Elam, age 45, a former accountant who had become president in 1980 and CEO in 1982.

On 1 October 1985, MAXXAM Group, led by well-known 'corporate raider' Charles Hurwitz, made an initial bid of $36 per share for PL's common stock, 47% above the market price one month earlier. PL's board unanimously rejected MAXXAM's bid, financed by Drexel Burnham Lambert, as inadequate. The board engaged Salomon Brothers to solicit other bids; although a number of potential bidders visited Scotia, none made an offer before October 24, when PL's board unanimously accepted MAXXAM's revised $40 offer. Board approval turned MAXXAM's offer friendly, thereby avoiding an 80% supermajority provision that would otherwise have applied. MAXXAM purchased 65% of PL's stock under the board-approved offer and effected a merger in February 1986, after 82% of PL's shares (including MAXXAM's 65%) were voted in favor of the transaction.

The rapid capitulation of PL's board took most observers by surprise, and generated a number of lawsuits alleging that PL's directors had accepted an inadequate offer to gain MAXXAM's promises of indemnity from lawsuits, lucrative severance pay, and guarantees of future jobs. These claims were settled in 1994 by a $52 million payment from MAXXAM, PL, their insurers, and other defendants. Allegations of insider trading by Michael Milken and Ivan Boesky and of stock parking by Boyd Jeffries led to Congressional hearings on the PL takeover, chaired by Rep. John Dingell (U.S. House of Representatives, 1987). These claims were also settled in 1994 for an additional $90 million from the fund established by Drexel, Michael Milken, and Ivan Boesky.

[2] These trees (Sequoia sempervirens or coastal redwoods) exist in material numbers in only one location: the 500-mile strip extending from around Big Sur (a bit south of San Francisco) to the southwestern tip of Oregon, and up to 30 miles inland from the Pacific Ocean. Old-growth redwood trees are the source of a beautiful fine-grained softwood, which accordingly commands premium prices; upper-grade redwood sells at about 2.5 to 3 times the price of the lower-grade redwood from younger trees.

A week before the February 1986 merger, PL announced it would increase its timber harvest by 20–25%. Four months later, an SEC filing indicated that PL planned to double its harvest. MAXXAM justified the increase by citing an independent timber survey it had commissioned which estimated that PL had 30% more standing timber and 45% more old growth than prior management had realized pre-takeover. At the merger, PL's annual lumber capacity was 150 million board feet (mmbf), operating one shift per day at its three mills (1985 lumber production was 137 mmbf). In May 1986, PL purchased another old-growth mill, increasing its annual capacity to 200 mmbf (one shift per day). Post-takeover, PL's lumber production increased from an annual average of 123 mmbf over 1980–1985 to 263 mmbf in 1986–1995, while lumber shipments increased from an annual average of 122 mmbf over 1982–1985 to 258 mmbf in 1986–1995. Soon after the takeover, the media reported that PL had begun to clear-cut its old-growth forests, departing from prior management's stated policy of selective logging.

Environmentalists' reactions to PL's plans to accelerate logging were swift and confrontational. Organized protests began soon after the takeover and continue to this day. Ongoing litigation has challenged PL's timber harvest plans and has consistently interfered with the firm's ability to log its land. Two environmental groups have been particularly persistent in bringing the threatened old-growth redwoods to public attention – Earth First!, which organized the 1990 'Redwood Summer' protest and whose surreptitious explorations of PL's lands resulted in the discovery of the previously unknown Headwaters Forest, and the Environmental Protection Information Center (EPIC), which has tenaciously fought PL's timber harvest plans in the courts.

3. The Pacific Lumber takeover and its aftermath: the media version

The print and television media provided – and continue to provide – widespread coverage of MAXXAM's post-takeover changes at PL. The story they report is dramatic, engaging, and often prompted by environmentalists' actions, particularly by the colorful protests of Earth First! (Bari, 1994; Harris, 1995). Media coverage of PL spans a broad variety of national newspapers, magazines, and television programs, as well as environmental publications, major California newspapers, and the financial press. The ethical and sociological implications of the PL story are explored in academic treatises (Newton, 1989; Zey, 1993, pp. 30, 68–69), while a recent book targeted at the general public (Harris, 1995) describes MAXXAM's takeover and its aftermath.

3.1. Dissemination of the PL story

The Appendix provides publication source, date, author (when named), and selected quotations from 76 feature articles and editorials that discuss the PL takeover and subsequent events from January 1986 through December 1996. We categorize the publication sources for the 76 articles as (1) national magazines and newspapers, including *Time*, *Newsweek*, *Readers' Digest*, and the *New York Times* and *Washington Post*; (2) the national financial press, including the *Wall Street Journal*, *Fortune*, and *Business Week*; and (3) two major Los Angeles and San Francisco newspapers, the *Los Angeles Times* and *San Francisco Chronicle*.

Table 1
Pacific Lumber print media coverage: annual incidence of articles in major outlets and circulation of periodicals that published them over January 1986–December 1996

This table gives a yearly summary of the 76 articles abstracted in the Appendix that appeared in national newspapers or magazines, the national financial press, and in two major California newspapers. See the Appendix for a summary of the sampling algorithm used to identify these articles. The far right column gives the *per issue* (e.g., one day's average circulation for the *Wall Street Journal*, one week for *Time* magazine, etc.) total domestic circulation of the publication sources for the year that each article appeared. The circulation figures are obtained from various issues of Audit Bureau of Circulations (FAS-FAX Report), Gale Directory of Publications and Broadcast Media, and Working Press of the Nation.

Year	Number of articles	Total circulation
1986	1	706,577
1987	10	10,064,887
1988	8	5,553,529
1989	8	22,125,587
1990	5	6,367,160
1991	4	5,502,117
1992	2	2,365,812
1993	6	5,346,586
1994	6	12,125,556
1995	3	1,656,024
1996	23	28,764,745
Total	76	100,578,580

Table 1 reports year-by-year total circulation for the periodicals that published the 76 feature articles and editorials.[5] These data indicate that coverage of the PL case has been remarkably broad and persistent, with a total circulation of 100 million periodical copies over the 11 years since the takeover. The

[5] This tabulation understates the amount of publicity because it does not include (1) non-feature articles, i.e., news stories that reveal new developments at PL, (2) television coverage, (3) legislative coverage (PL was the subject of two Congressional hearings and one hearing in the California state legislature), (4) coverage in newspapers other than the *New York Times*, *Washington Post*, *Christian Science Monitor*, *Los Angeles Times*, and *San Francisco Chronicle*, (5) coverage in alternative, or 'new age' publications, (6) articles on the 1980s in which PL was not a major focus, and (7) books (e.g., Harris, 1995) that discuss the PL case.

extensive coverage in 1996 is due to the fact that environmental issues in general and saving Headwaters Forest in particular were high on the Democrats' election-year agenda. (The Appendix shows that 1996 media coverage declined substantially after the Clinton administration's preliminary agreement to buy Headwaters was announced shortly before election day.)

The dissemination of the PL story began with the July 1986 SEC filing that revealed MAXXAM's plans to double PL's timber harvest. This disclosure generated immediate protests by environmentalists, including several dramatic Earth First! rallies, which received prominent coverage in California newspapers in late 1986 and early 1987. The story was picked up by *Newsweek* in July 1987 and by the *Washington Post* in August 1987; later that year Rep. John Dingell (D, Michigan) chaired Congressional hearings and the California state legislature also held hearings. The *New York Times* ran a lengthy article in March 1988, and by mid-1989 the story was appearing in high-circulation periodicals such as *Readers' Digest* and *Rolling Stone* that typically do not focus on corporate takeovers.

The national media had incentives to pursue the PL story because its main developments occurred when (i) the controversy over ostensible Wall Street greed was coming to a head, and (ii) environmentalists had begun to generate widespread public interest in saving the ancient forests of the Pacific Northwest. Regarding (i), Dennis Levine was charged with insider trading violations in May 1986; the Boesky scandal broke in November 1986, followed by the SEC's revelation that it was investigating Drexel's junk bond operations and the firm's ties to Boesky. During this period, many members of the business community, the media, and government expressed concerns about the allegedly damaging activities of so-called raiders who used junk bond financing to seek control of publicly held firms that had in the past seemed immune to takeover.

Regarding (ii), research that establishes the ecological importance of old-growth forests began to surface in 1983 (Zakin, 1993, p. 229). In 1988, the Wilderness Society held an old-growth conference at which renowned environmentalist Brock Evans told the crowd, "We have to make it a national issue .... That's the only thing that's going to save it" (Zakin, 1993, p. 267). And that is exactly what environmentalists did, with the national media providing major coverage of the controversy over old-growth forests and endangered species such as the northern spotted owl. PL was included in this coverage because Wall Street's alleged threat to the ancient redwoods was dramatic in its own right, and the timing and circumstances of the takeover dovetailed with both a major environmental movement and general public concern over takeovers.

To give readers a reasonably comprehensive yet parsimonious picture of the media version of the PL case, we next present it using direct quotations from the articles in the Appendix, i.e., using journalists' own words. For simplicity of presentation, we omit quotation marks, although all passages are quoted verbatim. The number in brackets following the quote gives the Appendix location of the

more complete abstract. We do *not* claim that the dramatization we next present characterizes the media treatment in *every* case, as one finds an occasional even-handed discussion of the necessity to trade off the interests of commercial timber firms and those of the public. Moreover, we quote the more colorful phrases from each article. Nonetheless, the sheer volume of articles – 76 in major periodicals – indicates that media dramatization of the PL case is a widespread phenomenon.

3.2. *The Pacific Lumber parable, as told by the news media*

Headwaters is a national treasure and one of our last connections to a primeval past. If President Clinton saves it, he will have the backing of the American people and the gratitude of generations to come. [27] Loggers have never entered the (Headwaters) forest, and many trees are 1,700 years or older and stand taller than the Statue of Liberty. [11] Why is Hurwitz suddenly so eager to send chainsaw gangs charging into groves that Pacific Lumber left untouched for more than a century? Perhaps it has something to do with his negotiations with the Clinton administration, which is anxious to take the largest stand of virgin redwoods out of private hands. [72] The sublime objects of these passions stand silent, as they have since long before Columbus reached the new world, their sylvan beauty marred only by a blue slash of paint here and there across their mammoth trunks – a slash that means 'marked for harvest'. [25]

A good story to explain the link between the unreal and the real – a parable for the Reagan decade – has been taking place ... in Humboldt County.... It is a story about Michael Milken, junk bonds, Ivan Boesky, Drexel Burnham Lambert, enormous conglomerates – and between 10,000 and 12,000 acres of virgin redwoods. [7]

There are few places where the battle between cowboy capitalism and wilderness preservation has been fought with such ferocity as Scotia .... It all began in 1985 when a smooth-talking corporate raider from Houston decided to buy all the shares of Scotia's only employer, The Pacific Lumber Company, a prosperous but undervalued family business.... [23] Largely family-run for most of a century, with a reputation for enlightened management of its trees and benevolent paternalism for its people, Pacific Lumber – the world's biggest private owner of virgin redwood – was seen as a model timber company and secure employer since it began producing timber in 1887. [2] Before the takeover, Scotia (pop. 1,200) ... could have been dropped whole into Disney! and, right between Frontierland and Tomorrowland, as Happy Mill Town. [36]

After he grabbed Pacific (Lumber) in a 1986 hostile takeover, paid for largely with junk bonds issued by Drexel Burnham Lambert's Michael Milken, Hurwitz visited Pacific's mill at Scotia. "There's a little story about the golden rule", he told employees. "He who has the gold rules". [18] Charles Hurwitz' America is a merciless jungle of capitalist predation, where 2000 year-old trees are interest payments on high-risk debt. In his America, friends like Michael Milken can float

$900 million in junk bonds to finance the takeover of a century-old company like Pacific Lumber. [19] Hurwitz soon set about paying off his newly acquired high-leverage debt. And how did he propose to do that? Why, by doubling the rate of timber production, by replacing selective harvests with wholesale clear cuts, and by upping the take from the virgin stands, which, alas, yield bigger bucks than do boards hewn from younger logs of the second growth .... In the shrinking world of Wall Street there was hardly a ripple of interest in the degree to which Pacific Lumber may or may not have been sensitized to environmental concerns. The Wall Street folks couldn't care less about clearcuts. [5]

Because Michael Milken invented this wonderful new tool called the junk bond, twice as many trees are crashing to the ground in Humboldt County. [7] In the frenzy to cut trees, Hurwitz also managed to overturn a well-run family business. [43] For 117 years, family-operated Pacific Lumber was a model corporation. [67] "This was the crown jewel of the North American timber industry", he (Mr. Bertain) said. [16] "This is a very important example of the takeover and dismemberment of a good corporate citizen", said Representative John D. Dingell. [4]

Cutting trees to cut debt may have seemed like a simple solution. But to many, harvesting redwoods is akin to filling in the Grand Canyon. [36] ... there are horror stories about the consequences of excess leverage. MAXXAM Group Inc., which acquired Pacific Lumber with a huge issue of junk debt, is sawing down 1,000-year-old redwoods to meet (debt) payments. [35] "We went into an area where probably no man had set foot in a century or more", an (unnamed) employee said. "It was a wonderland in there and everything standing was felled. We left a moonscape". [8] "This was all untouched on Monday", Newman said, shaking his head .... Newman, a member of the radical environmental movement Earth First! was walking on timberland owned by Pacific Lumber Co. The clearing was once a grove of old-growth redwood trees between 200 and 2,000 years old .... [49] The stately trees, most pre-dating the American Revolution and some as old as the Magna Carta, are now being clear-cut to pay the cost of MAXXAM's 1985 takeover, environmentalists say. [3]

If you look on p. 39 of the federal indictment of Michael Milken, you'll see the reason for this story. That's where the feds describe how – in their opinion at least – the king of junk bonds pulled on the levers of capitalism, got all the gears cranking and eventually caused whole forests of redwoods to come crashing down along California's North Coast. [56] It is a story of the collision of 1980s Wall Street finance with a century-old, family-run company, a story of junk bonds printed on redwood pulp. [49] At a New York lunch last year, Mr. Hurwitz was surrounded by admiring Wall Stréeters. According to attendees, Mr. Hurwitz took in the plaudits and observed: "wait till you see what happens with Pacific Lumber – it's going to be worth a whole lot more than you think ... a whole lot". [40] On a May evening in Houston, a mock logger with a real chain saw dismembered a hunk of redwood at the 50th birthday banquet of financier Charles E. Hurwitz. Just a poke in the ribs, Texas-style for Western

environmentalists' most hated foe. [62] Even now, the chain saws are howling in the forests surrounding this small lumber town (Scotia). They are cutting to pay some heavy bills, debts that were incurred 1000 miles south in the Beverly Hills offices of Drexel Burnham Lambert. The connection between those chain saws and Milken may turn out to be a milestone of the '80s. [56]

For many residents of this community (Eureka), the Pacific Lumber takeover has come to epitomize the social and environmental costs of the junk bond era of the 1980's. [16] The battle raging over the Pacific rain forest broke out of the backwoods and into the national spotlight 10 years ago in the far northwestern corner of California .... And it still rages there to this day, a head-on collision at the intersection of Wall Street, Our Town, and Ecotopia. The conflict remains an indelible modern parable for all of us .... [24] "We are calling on Governor Deukmejian to silence the chain saws poised over the Headwaters Forest", declared Edgar Wayburn, a Sierra Club vice president. "This is the heart of the largest unprotected old-growth forest in the world .... This is the last stand". [58] This forest is much too valuable to end up as "lawn furniture and hot-tub decking", as one environmentalist says. [65] California Rep. Pete Stark (D) is even sharper in his criticism of MAXXAM, which he accuses of "aggressive, greedy management". [17]

The (Headwaters) forest is so dense that even at noon only a shaft or two of sunlight reaches its floor. From the sword ferns to the tufts on the leaves, everything is a gentle yellow-green .... The redwoods are colossal – 250 ft high, with trunks the size of a Volkswagen Beetle .... Some of the trees were here when Jesus was preaching. As the setting sun turns an ashen rose, I wonder how many of them will make it to the year 2000. [61] An aerial view of the Headwaters Forest in Humboldt reveals dense green stands of old redwoods, some of which have survived since before Rome fell. But just as prominent are acres of desolate land criss-crossed by now-abandoned logging roads. [65] Financier Charles Hurwitz wants the U.S. government to pay him hundreds of millions of dollars for 4500 acres of the ancient redwoods, in a remote California grove known as the Headwaters Forest. Otherwise, he says, he will press ahead with his plans to cut the trees down. [40]

The fifth or sixth reel of an ongoing eco-melodrama involving the threatened cutting of ancient California redwoods flickered to a close last week, though more perils lurked. There lay the heroine, hog-tied to the tracks; there came the choo-choo; there gloated the villain, twirling his mustache. Logging was to begin in three days. Negotiators for the U.S. Department of the Interior were scripted as heroes .... [30]

4. The real economic threat to the ancient redwoods

Environmentalists' campaign to save the ancient redwoods focuses on MAXXAM's plans to log Headwaters Forest, the largest remaining virgin

redwood forest in private hands. Virgin redwood forests are especially valued by environmentalists because these ecosystems have evolved undisturbed and support a complex set of interdependent and potentially endangered life forms whose loss would have an unknown impact on human life. Although environmentalists emphasize the threat to Headwaters Forest, they are also concerned about PL's smaller remaining ancient groves. They are less concerned about PL's 'residual' old-growth redwoods, the old-growth trees left on land that had been previously logged, as these forests are no longer intact ecosystems.

4.1. Is MAXXAM'S takeover to blame for the threat to Headwaters forest?

The media view that MAXXAM's takeover is to blame for the threat to Headwaters Forest only makes sense if Headwaters would not have been logged by PL's old management. The evidence we next present indicates that Headwaters and PL's other virgin forests would have been logged under old management in approximately the same time frame as under MAXXAM. Panel A of Table 2 documents PL's timber holdings immediately before the merger, according to the Hammon, Jensen, Wallen, and Associates independent survey commissioned in late 1985 by MAXXAM, as disclosed in SEC filings. At year-end 1985 PL had 181,495 total acres of timberland, the vast majority of which had been logged pre-takeover. Virgin forest parcels – including Headwaters Forest – aggregated to 16,069 acres, or just 8.9% of PL's timberland. PL also had old-growth trees left as residuals on another 56,207 acres (31.0%) that had been cut on a selective logging basis.

These data indicate that, over the 100 years since PL began logging, management had steadily harvested old-growth redwoods so that only a small fraction of PL's timberland was virgin forest when MAXXAM took over. An internal PL memo dated 7 October 1985 (pre-takeover) states that "Presently we are cutting about 1200 acres of *virgin* old growth to meet the mill requirements" (U.S. House of Representatives, 1987, p. 104, emphasis added). Thus, every 2.5 years, PL's old management was logging virgin forests the size of Headwaters Forest.

Panel B of Table 2 reports estimates of the years left until all PL's virgin forests would be logged under old management's harvest policy. All PL's virgin forests – including Headwaters – would be logged in 13.4 years, or by 1999, if the firm continued to harvest 1,200 acres per year (Column 1). PL's virgin forests would last 9.7 years if instead from 1986 forward the firm harvested at the long-run rate that had prevailed from 1886 (when PL began logging) through 1985 (Column 2). Finally, PL's virgin forests would last an estimated 13.1 years if the firm harvested at the long-run rate measured from 1850 (when logging began in earnest in Northern California) through 1985 (Column 3). These estimates uniformly indicate that all PL's virgin forests would soon have been logged had old management continued its pre-takeover harvest policy from 1986 forward.

Table 2
Pre-takeover distribution of timber acreage for the Pacific Lumber company and estimated time until all of the firm's holdings of virgin forest are logged

Panel A gives the total acreage of redwood and Douglas fir holdings as of 1 January 1986, as estimated by Hammon, Jensen, Wallen & Associates and reported in the 1987 disclosure documents for the proposed merger of MAXXAM and MCO Holdings. Virgin old-growth stands refer to acres that have not yet been logged. Residual old-growth stands refer to acres that have been logged, but that still contain some old-growth trees. PL's pre-takeover policy was to harvest approximately 70% of the timber volume in a virgin stand and therefore initially leave a 30% residual for later harvest. [A small number of old-growth trees are also found in stands classified as young growth.] Panel B gives estimates of the time until all PL's virgin forests are logged. Column (1) assumes that PL continues to harvest virgin forest at the rate in force immediately before the takeover. Evidence submitted at the Congressional Hearing on the PL takeover includes an internal memo data 7 October 1985 (clearly pre-takeover) which states that "Presently we are cutting about 1,200 acres of virgin old-growth each year to meet the mill requirements" (U.S. House of Representatives, 1987, p. 104). Columns (2) and (3) present alternative estimates which assume that the annual harvest volume continues to follow its long-run pre-takeover path. These estimates calculate long-run annual reductions based on (i) the fact that 165,426 acres (91.9%) are no longer virgin forest and (ii) the assumption that this reduction occurred on a straight-line basis from the time harvesting began until immediately before the takeover by MAXXAM. Column (2) assumes that the reduction in virgin forest began 100 years prior (when PL began logging) while column (3) assumes the reduction began 135 years prior when, according to Melendy (1952), the timber industry began harvesting redwoods in Northern California.

A. Pre-takeover distribution of redwood and Douglas fir timber acreage

	Acres	Percent
Virgin old-growth stands	16,069	8.9%
Residual old-growth stands	56,207	31.0%
Young-growth stands	89,333	49.2%
Unstocked – Cutover and seedlings	19,886	11.0%
Total timber acreage	181,495	100.0%

B. Years until all virgin forests are logged

	Maintain Pacific Lumber's pre-takeover virgin forest harvest rate (1)	Maintain long-run harvest rate from the formation of Pacific Lumber (2)	Maintain long-run harvest rate from the inception of logging in Northern California (3)
Historical annual reduction in virgin forest inventory	1200.0 acres per year	1654.3 acres per year	1225.4 acres per year
Years until all virgin forests are logged if harvesting continues at given pre-takeover rate	13.4 years	9.7 years	13.1 years

Table 3 presents estimates of the years remaining for PL's virgin *redwood* forests under old management's and MAXXAM's harvest policies. (Because they use acreage data, the Table 2 estimates necessarily include old-growth Douglas fir.) Panel A of Table 3 indicates that old management expected to log all PL's virgin redwood forests in 13.1–16.4 years, or sometime between 1999 and 2002. Had old management possessed Hammon et al.'s timber survey, its revised estimates would appear as in Panel B; PL's virgin forests would last 19.1–23.8 years, six or seven years longer. Panel C indicates that, under MAXXAM's policy of doubling or tripling old management's harvest level, PL's virgin redwood forests would be gone in 10.1–15.1 years, or sometime between 1996 and 2001.

Table 3's most important finding comes from a comparison of the estimated years until PL's virgin forests were logged between what old management should have perceived, given its harvest strategy and information set (13.1–16.4 years), and what MAXXAM should have perceived when it increased PL's harvest rate (10.1–15.1 years). These estimates show no material difference in the expected survival dates for PL's virgin forests under old management and MAXXAM. Both groups planned to log all PL's virgin forests, and both expected to do so in about the same, relatively short time horizon. Thus, from the perspective of preserving virgin redwood *forests* such as Headwaters, the timber harvest strategies of old management and MAXXAM are essentially the same.[4]

From environmentalists' perspective, the critical point is that neither old management's nor MAXXAM's policies would preserve PL's old-growth redwood forests. Rather, both groups would have eventually logged all these forests *in their entirety*. Hence the debate about the environmental sensitivity of old management versus MAXXAM is entirely beside the point as far as preservation goes, since the ultimate effect of their harvest policies is identical. Ironically, the MAXXAM takeover may prove to be a preservationist windfall, since the publicity it engendered (and environmentalists' skill at stimulating that publicity) drew public attention to Headwaters. And PL's old management was systematically logging the firm's virgin forests at a pace that was slow enough — either deliberately or inadvertently — to keep them off environmentalists' radar screens.

[4] Using Hammon et al.'s updated figures, we estimate that PL's old-growth *trees* (including "residual" trees on previously logged land) would last 34–45 years longer under old management's harvest strategy. This longer horizon would benefit PL's current employees who earn wage premiums attributable to the difficulty of old-growth work. But it would harm potential current employees, since there would be less work to do in the short run. And it would reduce the *total* work for current and future employees as a group because the slower current harvest of old growth implies there will be less harvestable wood produced over the long run (see Section 4.2).

Table 3
Estimated number of years from year-end 1985 until all virgin forests are logged under the timber harvest policies of Pacific Lumber's old management (Panels A and B) and of MAXXAM (Panel C)

Panels A and B assume that PL will harvest between 40 and 50 million board feet (mmbf) of upper-grade redwood per year from its current inventory of old-growth redwoods (which are assumed to neither grow nor shrink significantly in volume over subsequent years). This harvest rate range was specified by old management as its long-run target in PL's 1984 Form 10-K. Our Panel A and B estimates assume that (i) PL will continue its policy of selective harvesting, with an average of 70% taken in the first pass and (ii) the firm will continue its policy of harvesting virgin old-growth stands before residual stands. (According to evidence reported in Congressional hearings, 1984 was the first year the company had logged a significant amount of residual old-growth — see U.S. House of Representatives, 1987, p. 100). Our Panel C estimates maintain assumption (ii), but assume the firm switches to clear-cutting of virgin forests. The figures in Panels B and C are based upon timber volume estimates for PL as of 1 January 1986 prepared by the consulting firm of Hammon, Jensen, Wallen & Associates, as disclosed in MAXXAM and MCO Holdings' joint proxy statement and prospectus dated 12 February 1987 and related documents. The figures in Panel A adjust the Hammon et al. estimates for old management's 45% misestimate of PL's inventory of old-growth redwood timber volume. Specifically, Panel A assumes that old management's estimate equals Hammon et al.'s timber inventory figure divided by 1.45. Old management's 45% old-growth volume misestimate was reported by MAXXAM in SEC filings following the takeover of PL.

Harvest rate	Time until all virgin forests are logged	Corresponding calendar year
A. Old management's timber volume estimates and planned harvest rates		
40 mmbf/year	16.4 years	2002
45 mmbf/year	14.6 years	2000
50 mmbf/year	13.1 years	1999
B. Hammon et al.'s updated timber volume estimates and old management's planned harvest rates		
40 mmbf/year	23.8 years	2009
45 mmbf/year	21.2 years	2007
50 mmbf/year	19.1 years	2005
C. Hammon et al.'s timber volume estimates and harvest rates doubled or tripled from 45 mmbf/year		
90 mmbf/year	15.1 years	2001
135 mmbf/year	10.1 years	1996

4.2. *Economic incentives to harvest old growth*

Fig. 1 presents estimates of the total acreage of old-growth redwood forests (all owners, not just PL) and the acreage protected in public parks at various dates from the mid-1800s until 1993. About two million acres of ancient redwood forests existed before logging began around 1850. Timber harvesting by private owners reduced the surviving acreage to about one-half its initial level

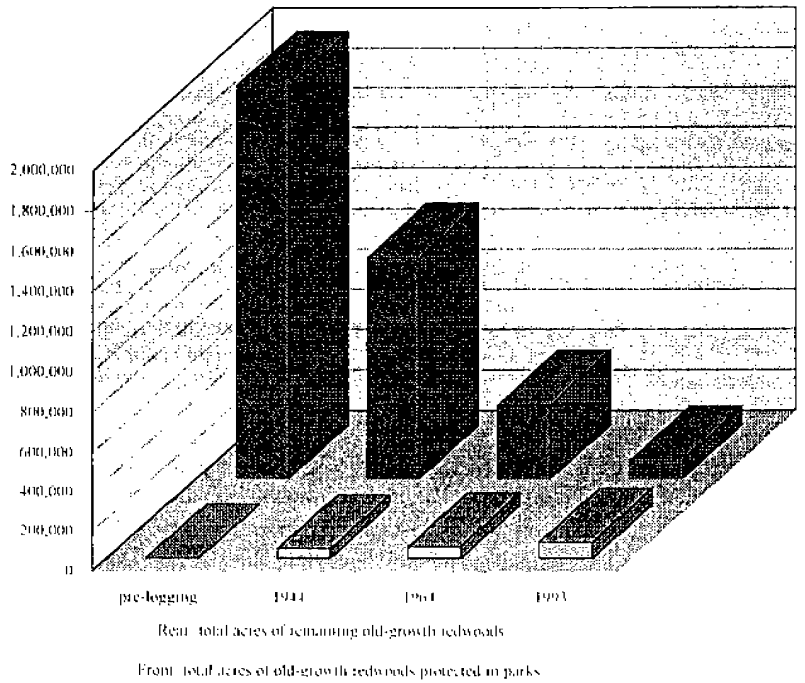

Fig. 1. Total acres of old-growth redwoods and acres of old-growth protected in parks at various dates from the pre-logging period through 1993. The back row reports the total acres of old-growth remaining at various dates, while the front row reports the total acres of old-growth protected in parks. The data for pre-logging and 1993 are from the Save-the-Redwoods League (1993) and the pre-logging estimates are quite close to figures compiled by Wieslander and Jensen (1946), as summarized in (Green, 1985, Table 5). The data for 1944 are from Wieslander and Jensen (1946), as reported in (Green, 1985, Table 5). The data for 1964 are from a survey conducted by Frank and Dean Solinsky, Inc. consulting foresters of San Francisco, as reported in (American Forest Products Industries, 1965, Table 4), a publication financed by the Pacific Lumber Company and other redwood industry companies. The acreage reported by the redwood industry is about 20% higher than the estimates of the National Geographic Society reported in (Dewitt, 1993, p. 16). The various sources summarized here differ somewhat in their study methods and specific definitions of old-growth redwood acreage, but all agree that the original inventory of old-growth has been radically reduced by logging.

by 1944, and the post-World War II housing boom caused a very substantial further reduction in the acreage surviving as of 1964. The Save-the-Redwoods League estimates that only 88,500 acres of old growth remained in 1993 (4.4% of the original total), of which 81,500 acres were protected in parks (92.1% of the

Table 4
Average annual growth rate (%) of redwood tree volume at various ages

The table presents the average annual growth rate in board-foot volume per acre for trees over 10.5 inches in diameter measured at breast height (international ¼-inch log rule). The growth rates for years 20 through 100 are calculated from forest volume data reported in (Lindquist and Palley, 1963, Table 14) and reproduced in (American Forest Products Industries, 1965, Table 3). These data are for an average quality site for timber growth and are based on the height of dominant redwood trees in a stand at the age of 100 years. The data in Lindquist and Palley indicate that similar growth patterns hold for good and best quality sites for timber growth. The growth rate figures for old-growth redwoods are generally agreed upon within the timber industry.

Tree age (years)	Annual growth rate (%)
20–30	10.8
30–40	6.5
40–50	4.1
50–60	3.0
60–70	2.4
70–80	1.9
80–90	1.6
90–100	1.3
Old-growth	Nil or negative

remaining acreage).[5] The steady reduction and ultimate depletion of nearly two million acres of ancient forest by private owners of redwood land over the last 150 years cannot plausibly be due to junk bond-financed hostile takeovers, a phenomenon of the 1980s.

So why have virtually all virgin redwood forests been logged? The answer is clear from Table 4, which summarizes the annual rates of growth in harvestable timber volume for redwood trees of various ages under average quality sites for promoting timber growth. Redwood timber volume grows rapidly when trees are young, slows to under 2% per annum after 60 or 70 years, and falls to 0% (and may turn negative) after trees attain old-growth status. The obvious implication is that profit-oriented owners have incentives to harvest old-growth redwoods and replace them with young trees that will generate a greater volume of salable wood product.

The incentive to replace old growth with young trees explains why virgin forests were just 9% of PL's timberlands before the takeover. PL's long-term

[5] The Fig. 1 data come from various studies that use different definitions of old growth and that were commissioned by parties with differing incentives to bias the estimates of remaining ancient redwoods. For example, some data are from timber industry sources, while others are from preservationists. All sources strongly confirm that, over the last 150 years, timber firms have steadily harvested the ancient redwoods in private hands.

harvest pattern matches that of the redwood industry over the last 150 years (Fig. 1). MAXXAM's planned treatment of PL's virgin forests differs only slightly in expected depletion date, and not at all in ultimate impact, from the policies followed by PL management over the previous 100 years. The profit motive – coupled with the fact that old-growth trees do not grow, while young ones grow rapidly – created incentives for *both* old management and MAXXAM to log Headwaters and PL's other ancient redwoods.

5. Other misleading aspects of the "Wall Street greed versus the environment" portrayal

The media version of the PL case includes several other distortions that attribute an impending environmental tragedy – the logging of Headwaters Forest – to MAXXAM's highly-leveraged takeover. The takeover is said to have enabled a profit-obsessed corporate raider to grab control of a well-run (not true) family firm (not true), whose management cared primarily about the welfare of its employees and the environment and hardly at all about profits (misleading at best, and probably not true). The reason the raider increased the timber harvest, thereby threatening Headwaters Forest, was to pay off his junk bonds (not true).

5.1. *Was old Pacific Lumber a "family firm"?*

PL was neither family-owned nor family-managed at the time of MAXXAM's 1985 offer. Proxy disclosures indicate that the Murphy family owned less than 5% of PL's common stock in 1985, as had been the case for at least ten years. Institutional ownership totaled 44.4% according to Standard and Poor's (36.9% per Value Line), a level typical for NYSE firms at the time (institutions held 35% of NYSE equities in 1980, per the New York Stock Exchange, 1985 Fact Book). The only Murphy family member employed at Pacific Lumber in 1985 was Warren Murphy, one of Stanwood's two sons, who was manager of lumber operations and is not listed in the 1984 annual report as one of PL's nine top corporate officers. Warren's mother, Suzanne Murphy Beaver, held one of nine seats on PL's board, as she had since Stanwood's death in 1972. These facts notwithstanding, the media often portray PL under old management as a sleepy little 'mom and pop' operation that was over-run by slick Wall Street types.

5.2. *Was old Pacific Lumber a well-run firm?*

The media often characterize old PL as a well-run, profitable firm, but one that could not support the crushing load of junk debt piled on it by MAXXAM. However, two highly visible indicators – PL's stock price and stockholders' willingness to sell shares – suggest that pre-takeover management was not well-regarded by stockholders. The stock, which in 1981 traded as high as $33–34 per share, languished in the low $20s throughout much of 1984. In September, old management announced a repurchase tender offer for 10% of the stock at $30 per share, a 16.5% premium above market. The offer was heavily oversubscribed with 33% of the shares tendered, which attracted the attention of Charles Hurwitz (U.S. House of Representatives, 1987, p. 24). The willingness of so many stockholders to sell at a modest premium suggests that many were dissatisfied with old management.

As it turns out, PL stockholders had good reason to be concerned about old management, which had not commissioned an independent assessment of the quantity of PL's standing timber since 1956 and thus had an incomplete understanding of PL's timber resources when approached by MAXXAM in late 1985. MAXXAM had commissioned an aerial survey of PL's holdings before launching its bid. Post-takeover, an independent survey of PL's holdings estimated that PL owned 30% more standing timber and 45% more old growth than old management thought. The amount by which old management had underestimated PL's timber holdings is remarkably large, raising doubts about its resource stewardship.[6] This underestimation may help explain why no white knight outbid MAXXAM and why management did not itself make an LBO offer to take the firm private.

Two tax-related factors also suggest that old management could have generated greater value for stockholders. First, PL had substantial unused debt capacity, with a 7.2% long-term debt to total capitalization ratio (at market value), and its dividend payout ratio ranged from 55.5% to 94.0% over 1977–1984. Since earnings averaged $39 million, a debt-for-equity substitution that used cash previously paid as dividends to service debt would have generated large tax benefits. Second, PL had substantial timber holdings that were carried on the books at a small fraction of their current value, hence that would generate large tax benefits from the post-acquisition asset value writeup available at the time. The value that could have been generated by this tax writeup made PL a natural candidate for a takeover or LBO, as did the facts that (i) many stockholders were willing to sell at a modest premium, (ii) PL owned significant non-timber assets that could be sold (e.g., its cutting and welding division and headquarters building), and (iii) PL's pension plan was overfunded by some $50–60 million.

[6] The fact that PL's standing timber was much greater than old management thought suggests that PL had for many years unknowingly harvested a timber volume far below the amount of new growth, which is the amount that should have been harvested under PL's sustained yield policy.

5.3. How 'environmentally conscious' was Pacific Lumber pre-takeover?

The media often contrast MAXXAM's environmental policies with those of prior management. Pre-takeover, PL was widely viewed as one of the more environmentally conscious redwood companies, largely because the firm was reported to practice only "selective logging" rather than clear-cutting. Without doubt, clear-cutting leaves an ugly landscape, with the potential for dangerous hillside erosion, runoff-polluted rivers, and damage to fish and wildlife. For these reasons, old management's selective cutting policy deserves praise for environmental sensitivity. However, the issue is not as simple as it is portrayed, due to three facts not discussed in any media accounts of which we are aware.

First, old management's pre-takeover harvest policy did *not* exclude clear-cutting, as media accounts often intimate. We obtained 15 timber harvest plans filed by PL with the California Department of Forestry during 1983–1985 that include clear-cutting proposals ranging from 11 to 258 acres. The PL board officially voted to approve clear-cutting in September 1985, before MAXXAM's offer (U.S. House of Representatives, 1987, p. 97). The memo presented to the board by PL's Forestry Department indicates that selective cutting was not entirely successful due to wind damage to the isolated residual trees and equipment damage to second-growth when residuals were logged. (PL first logged a substantial number of residual trees in 1984, hence was just gaining experience with the problems of logging residual old growth in second-growth stands.)

Second, the motivation for PL's selective cutting strategy was not solely old management's environmental sensitivity, as intimated in the media. It also reflected incentives to enhance company profits by minimizing taxes. A 1947 California law allowed the removal of acreage from the ad valorem tax rolls if 70% of the standing timber had been logged, enabling companies to hold 30% of their timber in inventory free of taxes for several decades. (The tax rationale for selective logging is described in testimony before Congress by CEO John Campbell (U.S. House of Representatives, 1993, p. 87).) At PL, old management's policy was to fell a full 70% of the timber volume in a given stand, the *exact* percent that minimized the firm's state taxes. The favorable tax treatment of selective cutting was removed in 1978 and, a few years later, PL's old management decided to resume clear-cutting on some of its lands. The facts that (i) the percentage felled equals that specified by the tax authorities, and (ii) old management resumed limited clear-cutting after the tax law changed suggest that old management's selective harvest policy reflected more than environmental sensitivity – it also reflected a profit motive.

Finally, relative to clear-cutting, selective logging damages a larger total of *virgin* forest, the timberland most valued by preservationists concerned with saving ancient ecosystems. Holding constant the total timber volume harvested, old management's selective cutting policy destroyed PL's virgin forests at a faster rate – in fact, at a much faster rate – than clear-cutting would have. At the time of MAXXAM's takeover, PL had 56,207 acres of residual old growth in cutover stands (per Table 2), which would translate into 16,300 acres of additional virgin old-growth forests had PL's old management practiced clear-cutting rather than the 70% selective cutting they actually employed. These 16,300 acres would *double* PL's virgin old-growth forests, giving the firm more than five additional tracts the size of Headwaters Forest for potential preservation. In this regard, old management's selective cutting strategy is difficult to justify as environmentally sensitive, although it likely benefited stockholders by reducing the risk that PL would be unable to log its virgin forests because of preservationists' actions.

5.4. Are PL's junk bonds responsible for MAXXAM'S increased harvest rate?

A pervasive claim about the PL takeover is that MAXXAM was forced to increase PL's timber harvest to pay off its junk bonds. PL is partly to blame for the popularity of this claim, since its representatives initially used the firm's debt to justify the increased harvest. It seems likely they did so because the need to generate cash to meet debt obligations is an excusable motive to most people, whereas the desire for greater profit is not. (Blaming the increased harvest on the need to service debt exacerbates the backlash against junk bonds and high leverage takeovers and creates an externality for other parties, e.g., other issuers of junk bonds.) Obviously, junk bonds cannot be responsible for the logging of the vast majority of virgin redwood forests owned by PL and other timber companies. Nonetheless, the possibility remains that junk bonds are to blame for the *increased rate* at which PL attempted to harvest its last 9% of virgin forests. In an earlier draft, we present extensive evidence inconsistent with this possibility; here, we summarize the main points of this analysis.

Our projections of interest coverage ratios and estimates of equity values indicate that, despite the higher debt level, MAXXAM could have maintained old management's harvest level post-takeover. This analysis assumes that MAXXAM did *not* increase the timber harvest above the pre-takeover level, but did (i) employ a high debt level (and captured the related tax benefits), (ii) sell non-forestry assets (including the cutting and welding division and the San Francisco headquarters), and (iii) capture the pension fund surplus and the acquisition-related asset value writeup. We carry out extensive sensitivity checks that consider a broad range of assumptions about operating profit margins, growth rates, risk, and capital market required rates of return. The sensitivity checks include a very conservative assumption that 1986 cash flow equals median 1977–1985 forest product cash flow, which grows at 5% (roughly the inflation rate, although redwood prices historically have grown at a higher rate).

In every case, cash flow generated at old management's pre-takeover harvest level is sufficient to cover PL's debt obligations at least through 1996 (the end of the forecast horizon we consider). Similarly, in every case our equity valuation

analysis indicates that old management's harvest strategy (coupled with the tax advantages of debt and the acquisition-related asset value writeup) generates an asset present value that exceeds the face value of PL's debt obligations. In sum, both coverage ratio and equity value estimates indicate that PL *could* have met its post-takeover debt obligations without increasing the timber harvest.

Some direct evidence that junk bonds per se are not responsible for PL's increased harvest rate is the fact that PL refinanced much of its junk-rated debt in March 1993 with investment grade notes, yet the firm continues to harvest at the increased level. Moreover, while PL's post-takeover levered free cash flow is almost universally positive, MAXXAM has chosen not to use that cash flow to reduce PL's debt. At year-end 1995, the book value of PL's long-term debt is $586 million (88.4% of total assets), which is virtually identical to the $594 million debt level (75.6% of total assets) at year-end 1986. If high leverage did force MAXXAM to make value-reducing operating changes at PL (i.e., to harvest too quickly), then as 100%-owner of PL's equity it certainly had strong incentives to avoid the operating policy distortion by paying down the debt, which it has chosen not to do.

Our findings suggest that MAXXAM increased PL's timber harvest because doing so was profitable on its own merits. This inference is consistent with the fact that old management believed it was optimal to harvest at a sustained yield rate, but was mistakenly harvesting at a considerably slower rate (Section 5.2). It is also consistent with the incentives of profit-oriented timber owners to replace old growth with younger trees (Section 4.2).

6. Resource allocation issues and the politics of finance

In 1987, the PL takeover was the subject of Congressional hearings and hearings in the California State Legislature; in 1993, the preservation of Headwaters Forest was the subject of Congressional hearings. In all three hearings, lawmakers emphasized that MAXXAM's takeover of PL was a case of Wall Street greed run amok. By demonizing MAXXAM and Charles Hurwitz, lawmakers (and environmentalists) rationalized proposals to compensate MAXXAM at less than the full timber value for Headwaters, including a proposal to pay no compensation at all. The government's decision to preserve Headwaters apparently reflected political expediency rather than a careful weighing of social costs and benefits.

6.1. Politicians' views of the PL takeover

The 1987 Congressional hearings, chaired by Rep. John Dingell (D, Michigan), focused on the legality of the PL takeover, including possible insider trading and stock parking violations, the involvement of Michael Milken and Ivan Boesky, and the impact on America's forests of acquisitions by junk bond-financed corporate raiders. On the latter point, Rep. Ron Wyden (D, Oregon) stated "the Pacific Lumber deal raises troubling questions about the future of the forest products sector in an era of mergermania. Personally, I am not convinced that the response of forest management includes mowing down trees in timber country to pay junk debts to particular (takeover) artists that live thousands of miles from our mill towns" (U.S. House of Representatives, 1987, p. 4).

The 1987 California State Legislature hearings on 'Sustained Yield Forestry Policy Part I: The Redwoods and the Raiders' began with the replay of a TV show called 'Takeover', which opened with the statement "Tonight on Express: Northern California's redwood empire ... is under siege from corporate raiders on Wall Street". This video clip was followed with opening remarks by Senator Barry Keene, co-chair of the hearings, which included statements such as 'SB 1641 was introduced to protect the forest economy from corporate raiders who convert trees into cash to pay off takeover debts' (California State Legislature, 1987, p. 8), and 'Manipulating the redwoods from Wall Street or Texas is like dropping bombs from a B-29 at 25,000 feet. Mr. Hurwitz and Mr. Milken need to come down to meet the people to explain to them the wisdom of their high-flying transaction' (California State Legislature, 1987, p. 9).

Table 5 presents other evidence of the connection between politicians' efforts to save Headwaters Forest and the media's 'Wall Street greed versus the environment' interpretation of the PL takeover. The table summarizes excerpts from the 1993 Congressional hearings on the proposed Headwaters Forest Act, which would have sanctioned the government's acquisition of Headwaters and surrounding timberland. These excerpts show that Congressional sponsors used the Wall Street greed theme to advance their case, repeatedly blaming the threat to Headwaters on PL's junk bonds (Panel A). The politicians' theme mirrored the media's portrayal, and Congressional supporters cited and/or introduced as exhibits several media reports about PL's debt, the takeover, and Charles Hurwitz's other activities at the hearings to bolster their case for preserving Headwaters (Panel B).

6.2. Headwaters Forest and the resolution of externality conflicts

Supporters of the Headwaters Forest Act argued that MAXXAM should not be compensated for the full timber value of the land, since environmental laws constrained the timber harvest, hence the profit potential. U.S. Rep. Hamburg (D, California) argued that "... no one can contend that the public should pay for value that could never be realized by the current owner. State and federal regulations undeniably limit harvest potential. Negotiations must establish a realistic value which is based on the actual ability to harvest" (U.S. House of

Table 5
Arguments to preserve headwaters forest advanced by members of the U.S. Congress

Panel A presents excerpts from lawmakers' statements during the Hearings before the Subcommittee on Specialty Crops and Natural Resources (Charlie Rose, D, North Carolina, Chair) of the Committee on Agriculture to consider H.R. 2866, the Headwaters Forest Act, U.S. House of Representatives, 13 October, 1993. Panel B lists articles quoted during the hearings and those reproduced as part of the Congressional record. The number in brackets at the end of each article gives the location in the Appendix of our abstract of that article.

A. Lawmakers' statements during the hearings

Rep. Dan Hamburg (D, California): "A great deal has been made of MAXXAM, Inc.'s aggressive harvesting of these forests since acquiring Pacific Lumber Company with junk bond revenues in a takeover nearly eight years ago ... Can we as a society afford to forfeit it (Headwaters) to satisfy the corporate debt obligation of an investor who practiced the art of the eighties' junk bond finance?" (pp. 124–125).

Rep. Fortney ('Pete') Stark (D, California): "You will hear today about the Pacific Lumber Company, which was in the history of our State for over 100 years a company that was revered for its forward-looking employment policies and timber preservation policies. That history was pretty much decimated by the junk bond financed buyout of Pacific Lumber by the MAXXAM Corporation controlled by one Charles Hurwitz. Since MAXXAM's takeover, the interests of (the) north coast community ... have given way to the relentless need to make interest payments on junk bonds and send the profits to MAXXAM's Houston, Texas headquarters" (p. 16).

Rep. Stark: "According to *Newsweek*, 'The Redwood Raider ... began plowing down California's coastal redwoods'. And this level of cut was based on what was good for servicing the junk bond debt ... The intention, I submit, was to liquidate this country by virtually destroying this timber area in Northern California" (p. 17).

Rep. Stark: "Frankly, Mr. Chairman, when people hear that 1,000 year old, virgin, old-growth redwoods are being chain-sawed to pay interest on junk bonds, support for the legislation grows" (p. 17).

B. Media articles quoted and reproduced in the congressional record

"Raider to the Rescue: Will Charles Hurwitz Save Continental", *Newsweek*, 27 July 1992. The article is not in our Appendix because Pacific Lumber is not the focus, but is quoted by Reps. Stark and John T. Doolittle (R, California).

"United Financial Group Is Liable In Collapse of Thrift, FDIC Says", *Wall Street Journal*, 22 May 1992, quoted by Rep. Stark. The article is not in our appendix because Pacific Lumber is not the focus.

"A Shady Bond Proposal That Makes One Pine for the 1980s" (Allan Sloan column), *Los Angeles Times*, 17 January 1993, introduced in its entirety, quoted by Rep. Stark. Identical to *Washington Post* article [15] in the Appendix.

"Rep. Stark's Bill Would Hurt Pacific Lumber's Timber Bonds", *Bloomberg Business News*, 18 March 1993, introduced in its entirety. The article is not in our Appendix because it is a news article, not a feature story.

"For Takeover Baron, Redwood Forests Are Just One More Deal: Hurwitz Wants U.S. to Buy His Trees for $600 Million or He'll Let Chainsaws In", *Wall Street Journal*, 6 August 1993, introduced in its entirety, quoted by Rep. Stark. Entry [40] in the Appendix.

Representatives, 1993, p. 125). Rep. Pete Stark (D, California) made the same point:

> You will probably hear wonderful testimony to the grand history of Pacific Lumber. What they will not tell you is the rather sordid history of one Charles Hurwitz and the MAXXAM Company. Hurwitz' business associates in his acquisition of Pacific Lumber are the convicted felons, Michael Milken, Ivan Boesky, and Drexel Burnham, Incorporated.
> Should this legislation pass, it is not the intention to provide a windfall profit to scurrilous operators, MAXXAM and Hurwitz. If the legislation passes, the value of the land would be judged not on what the timber would bring because, quite possibly, much of that timber could not be cut (U.S. House of Representatives, 1993, pp. 16–17).

The general approach advocated by Reps. Hamburg and Stark is of questionable legality and, if applied generally, would induce significant distortions in the resolution of externality conflicts. The takings clause of the Constitution stipulates 'nor shall private property be taken for public use, without just compensation.' This clause can obviously be rendered meaningless if the government can first pass laws that substantially impair property values and then force a sale at the government-induced lower valuation. If such actions were legitimate, resource misallocations would surely follow as the political process was used by interest groups to generate legislation that would impair the value of privately owned assets they would like to see acquired by government.

Congressional supporters of the Headwaters Forest Act clearly did not conduct a cost-benefit analysis of the type that economists argue is necessary to allocate resources efficiently. Such an analysis would weigh the social benefits of saving Headwaters (e.g., the value of preserving an ancient ecosystem for future generations) against the social costs (including the value consumers place on the timber that could be harvested from this forest). Rather, lawmakers seem to have *assumed* that saving Headwaters is desirable, then to have looked for ways to rationalize appropriation at the lowest possible cost. It seems reasonable to infer (especially from the language used by Rep. Stark) that minimizing the compensation paid for Headwaters would be justifiable to the public at large because of the allegedly evil methods, motives, and felonious business associates of MAXXAM and Charles Hurwitz.

In their campaign to save Headwaters, environmentalists used the Wall Street greed theme both to attract media attention and in a clever attempt to confiscate these lands. Specifically, they proposed a "Debt-for-Nature Swap" in which PL would forfeit Headwaters Forest as payback for a $1.5 billion government bailout required by the 1988 collapse of United Savings Association of Texas, a firm in which two Hurwitz-controlled firms held a combined 23%. The

Debt-for-Nature Swap aided environmentalists by providing the populist argument that the American people had already paid for Charles Hurwitz's greed and so it was only fair that they receive Headwaters as compensation. For example, Earth First! leader Darryl Cherney argued that "The American taxpayer should not have to pay a dime for Headwaters Forest. We already bought it" (*Eureka Times-Standard*, 4 October 1995).

The legal foundation for the Debt-for-Nature swap is dubious since it overrides the limited liability protection of incorporation. (Headwaters would be taken from PL, 100%-owned by MAXXAM, a publicly held corporation in which Hurwitz held a controlling interest, as compensation for the government bailout of a firm in which MAXXAM and another Hurwitz-controlled company owned stock.) Nonetheless, Rep. Stark raised the possibility of a Debt-for-Nature Swap in the 1993 Congressional hearings: "I might ask you to think back to that $500 million owed to the Federal Government as we talk about at some point in the future the costs of this bill to our society" (p. 17). The weak legal foundation may help explain why the Clinton administration chose to compensate MAXXAM. The agreement to buy (rather than confiscate) Headwaters respects the takings clause of the Constitution, and in this sense represents appropriate government behavior in resolving this land use conflict.

But other aspects of the Headwaters agreement suggest it was driven by political expediency (witness its pre-election timing) rather than by a careful weighing of opportunity costs. Headwaters contains 3,000 acres of virgin forest, which will add only 4% to the 81,500 acres of old-growth redwoods in public parks. Cutover redwood land sells for about $600 per acre (U.S. House of Representatives, 1993, p. 261). The $380 million needed to purchase Headwaters would buy 633,000 cutover acres (if available, at $600 each) or almost one-third of the two million acres on which redwoods grew before logging began. If the government purchased cutover land, in several hundred years it would recreate an enormous old-growth redwood forest.[7] This alternative would seem to merit consideration in a rational analysis that weighed social opportunity costs. But we find no evidence that it or *any* other alternative was ever seriously considered in the decision to preserve Headwaters.

Why not? We believe the explanation lies in part in the narrow way the PL controversy was framed by the media, environmentalists, and politicians. The

[7] While society would gain a vastly larger redwood preserve, it would do so at a much later date, and the land would be marred by the presence of large stumps. Society would also bear any loss of endangered species and reduction in biodiversity as Headwaters was logged. Nonetheless, this general approach characterizes the broad-based 'Restoration Ecology' movement and it has been successfully implemented in redwood parks such as the Arcata Community Forest and Redwood National Park.

'crisis' was pitched as a dramatic story of a corporate raider's threat to an ostensibly unique tract of virgin redwoods. The dramatic pitch was probably necessary to capture the public's attention, but it narrowly focused the public on saving Headwaters, rather than on the threat to ancient redwood forests and to ancient forests of all species. Since politicians have incentives to 'solve' specific crises that voters *perceive* as important, they will limit the extent to which opportunity costs are considered in resolving externality conflicts, such as those involving the appropriate use of ancient forests. Such issue-by-issue resolution leaves undebated and unaddressed the critical question in these cases: is the public willing to pay to preserve ancient forests, or does it prefer to consume timber products and/or use the land for agriculture or development?

The narrow focus on preserving Headwaters Forest may also reflect politicians' incentives to pursue projects with accelerated benefits (that accrue to current voters) and delayed costs (that are borne by parties who cannot vote on the politicians' re-election). Preservation projects generally entail the opposite profile; the costs of acquiring land are accelerated to the present while the benefits are spread over many future generations. This cost/benefit profile will tend to undercut politicians' interest in preservation projects in general, and focus their attention on the subset of preservation projects with more immediate measurable payoffs to current voters.

7. Conclusions

The Pacific Lumber case illustrates (1) how a misreading of economic facts can take on a life of its own when reported by enough credible and apparently independent media sources, and (2) how the public's resultant erroneous perceptions can have substantial resource implications for firms and for society as a whole. For 11 years, the media, government officials, and environmentalists have blamed MAXXAM's 1986 highly leveraged takeover of PL for the threat to Headwaters Forest. This paper provides contradictory evidence: 91% of PL's ancient forests had already been logged before the takeover and PL's prior management was systematically proceeding to log *all* the firm's old-growth redwoods. Moreover, the expected dates by which all PL's virgin forests would be logged differ by just a few years under old management and MAXXAM. Thus the threat to Headwaters Forest is not attributable to junk bonds, high leverage, or hostile takeovers -- rather, immediate harvest is economically attractive because old growth has stopped growing and young trees grow rapidly. Consistent with this explanation, fewer than 5% of the original old-growth redwood forests remain unlogged today.

By portraying the PL takeover as a case of 1980s Wall Street greed versus the environment, the media wove a fascinating morality tale with broad readership

appeal. Politicians, picking up the refrain, gained a cause that appealed to environmentally conscious voters. Had the media published the 'truth' – that profit-oriented timber owners have incentives to log ancient forests, which no longer grow – the PL case would not have the same shock value. The media treatment of the PL case closely fits the pattern predicted by Jensen (1979), who argues that market demand induces the media to publish entertaining stories that portray dramatic conflicts as confrontations of 'good' versus 'evil' personalities. He suggests, moreover, that most readers cannot tolerate ambiguity and therefore demand simplistic explanations rather than the carefully detailed analysis required to understand complex phenomena. In Jensen's view, the media treatment of the PL case reflects a natural economic response by reporters to supply the entertainment and simplicity demanded by readers.

The media, environmentalists, and politicians likely portrayed the PL takeover as a case of Wall Street greed destroying the environment because MAXXAM increased PL's timber harvest at a time when (i) the controversy over Wall Street practices peaked with the government's investigations of Milken/Drexel, and (ii) environmentalists had begun to generate widespread public interest in saving ancient forests. Our circulation data establish that the PL story was widely disseminated – probably because it ostensibly illustrates a dramatic environmental conflict in which Wall Street greed threatened the last remaining ancient redwood forests. Since the potential destruction of a unique American treasure by Wall Street 'greedmongers' has the ability to enrage the public in a way that few other environmental issues can, the PL case likely contributed to the emotional intensity of the public backlash against junk bonds and hostile takeovers.

The resource implications of the media treatment of PL are immense. By framing the threat to Headwaters Forest as they did, radical environmentalists with virtually no funds were able to convince the government to preserve an ancient forest at a cost of some $380 million in public funds. The Clinton administration likely entered into this agreement – with no apparent consideration of opportunity cost or other alternatives – because the publicity Headwaters had received (and radical environmentalists' skill at stimulating and timing that publicity) made it a popular election-year environmental 'crisis' that could be 'solved' weeks before the election. The personalization of the PL case, which blamed the threat to one ancient forest on Wall Street greed, channeled the debate on ancient forests away from the real economic threat to their existence. The demonization of Charles Hurwitz and MAXXAM enabled lawmakers to consider seriously proposals to confiscate Headwaters for little or no compensation. The PL case suggests the hypothesis that government responds to resource conflicts that are successfully sold to the public as dramatic crises; interest groups will therefore emphasize emotional appeals (not 'rational' economic analysis) to influence the allocation of resources.

At this writing (September 1997), environmentalists have seemingly won the battle to save Headwaters.[8] But this apparent victory has come at the cost of failing to inform the public about the real threat to America's ancient forests. These forests will not be saved by stopping Hurwitz/MAXXAM, Milken/Drexel, and junk bond-financed hostile takeovers. Ancient forests – of all species, not limited to redwoods – are steadily disappearing because old trees no longer grow and young trees grow rapidly, a physical reality that drives the harvesting decisions of profit-oriented timber owners. These owners, in turn, respond to consumer demand. If society wants to save the remaining ancient forests, it will have to provide resources to buy these forests and hold them out of timber production, thereby forgoing consumption of old-growth wood products. This important point has been lost in the public portrayal of the PL case.

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Appendix A. Print media feature articles and editorials about the Pacific Lumber Company (January 1986–December 1996)

This Appendix catalogs 76 articles about The Pacific Lumber Company (PL), grouped into three categories according to source: (I) national magazines and newspapers, (II) national financial press, and (III) two major California

[8] Since October 1996, MAXXAM's agreement with the government has shown some signs of unraveling, and it is unclear what the final outcome will be. Radical environmentalists, moreover, would disagree with the statement that they have 'won', as they are unhappy with the Clinton administration's agreement to purchase Headwaters because they had hoped to acquire 45,000–60,000 acres, including a substantial 'buffer zone' and several of PL's smaller old-growth groves.

newspapers (*Los Angeles Times* and *San Francisco Chronicle*). For each article, the entry below gives the source and article title (boldface), publication date and author (when named), and excerpted passages. The article number in square brackets is used for ease of reference in the text of the paper.

We identified these articles from on-line searches of ABInform, the Melvyl Periodicals Data Base, USCInfo's Magazine Index, and the hard copy indices for the *New York Times*, *Wall Street Journal*, *Los Angeles Times*, and *San Francisco Chronicle*. We are confident that our search uncovered the bulk of the articles in categories I and II. Our catalog of local newspaper coverage is less complete, since category III excludes all but two California papers and all out-of-state local papers. In constructing this Appendix, we excluded many articles that, in our judgment, predominantly reported new developments in the PL case, e.g., about various judicial decisions affecting PL's ability to harvest old-growth trees. Almost all articles cataloged here focus on PL and/or MAXXAM. In a few cases, the articles focus on another subject but discuss the PL case. For example, the 11/4/90 *New York Times* article deals principally with Earth First! and radical environmentalism.

I. National magazines and newspapers

[1] Newsweek (7/6/87; P. Abramson) — **Razing the Giant Redwoods: A Houston Investor Takes on a National Treasure**

Now Hurwitz ... is busily chopping down the redwoods to pay off massive debts ....

... he began attacking the company's birthright: thousand of acres of so-called old-growth redwoods.

Hurwitz doubled the rate at which the trees were harvested ... and then started clear-cutting the trees instead of leaving many standing to preserve the tall forest.

California senate majority leader Barry Keene stated that "the New York junk bond market needs to realize that the California redwoods are going to stay".

[2] Washington Post (8/30/87; P. Nussbaum) — **Takeover Triggers Battle Over Giant Redwoods**

Largely family-run for most of a century, with a reputation for enlightened management of its trees and benevolent paternalism for its people, Pacific Lumber — the world's biggest private owner of virgin redwood — was seen as a model timber company and secure employer since it began producing timber in 1887.

In the era of Wall Street corporate raids, Pacific Lumber was taken over, bought up by a Houston real estate and oil magnate. To help pay for the $750 million debt created by the controversial purchase, the new owner has doubled the company's redwood lumber production.

Efficiency for Pacific Lumber now means clear-cutting groves of old-growth redwoods, instead of the "selective cutting" method long practiced by the company before the takeover.

[3] Christian Science Monitor (11/18/87; C. Sullivan) — **Clear-Cutting Controversy: California Redwoods Embattled Anew**

The crash of ancient redwoods felled in Humboldt County is echoing far beyond California's north coast – and reaching all the way to Wall Street and Capitol Hill.

The stately trees, most pre-dating the American Revolution and some as old as the Magna Carta, are now being clear-cut to pay the cost of MAXXAM's 1985 takeover, environmentalists say.

... many people in these parts express outrage at what has happened to Pacific Lumber. Before the takeover, the company was widely regarded as the most environmentally sensitive in the industry, selectively cutting its old-growth under a sustained-yield policy.

[4] New York Times (3/2/88; R. Lindsey) — **Ancient Redwoods Fall to Wall Street Takeover**

Thousands of redwood trees are being felled along California's wild northern coast in an environmental drama that is arousing high emotions and demonstrating how decisions on Wall Street can affect people, communities, and natural resources far away.

"To pay off this big debt, they're just chewing up the environment", said John Maurer, a former employee who quit to protest the new policies. "And now they're taking out the cream so there won't be anything left for the future". One worker, who said he did not want his name published because he feared company reprisal, said cathedral-like groves of old redwoods towering more than 300 feet were being "mutilated".

"This is a very important example of the takeover and dismemberment of a good corporate citizen", said Representative John D. Dingell, Democrat of Michigan, chairman of the Energy and Commerce Subcommittee on Investigations and Oversight.

[5] Audubon (September 1988; J. Mitchell) — **Tree-Sitters Protest as Old Redwoods Fall to a Corporate Raider**

For generations the family-owned Pacific Lumber Company of Scotia, California, went about its business as quietly as a company possibly can ... Logging crews went into the forest and took a few trees here, a few over there ...

The battle started on Wall Street. ... Hurwitz came up with $795 million in notes, financed in part through Drexel Burnham Lambert, the "junk bond" specialist currently under investigation in a federal probe stemming from the Ivan Boesky arbitrage case. Small world, Wall Street.

... Hurwitz soon set about paying off his newly acquired high-leverage debt. And how did he propose to do that? Why, by doubling the rate of timber production, by replacing selective harvests with wholesale clearcuts, and by upping the take from the virgin stands, which, alas, yield bigger bucks than do boards hewn from younger logs of the second growth.

In the shrinking world of Wall Street there was hardly a ripple of interest in the degree to which Pacific Lumber may or may not have been sensitized to environmental concerns. The Wall Street folks couldn't care less about clearcuts.

[6] Sierra (September/October 1988; J. Bahls) — **A Timber Takeover's High Toll: What do corporate raiders and junk bonds have to do with how fast U.S. forests are logged? More than you might think.**

Pacific Lumber's $680-million debt now drives the harvest.

According to environmentalists, the forest giants should not be cut at all. "My motivation is to get these trees saved", says Richard Jay Moller, lead attorney for the Environmental Protection Information Center. "I think it's a crime to cut down a 2,000 year old tree and make it into picnic tables".

[7] Rolling Stone (8/10/89; B. McKibben) — **Milken, Junk Bonds and Raping Redwoods**

A good story to explain the link between the unreal and the real – a parable for the Reagan decade – has been taking place over the last few years in Humboldt County, California.

It is a story about Michael Milken, junk bonds, Ivan Boesky, Drexel Burnham Lambert, enormous conglomerates – and between 10,000 and 12,000 acres of virgin redwoods.

It was a deal that summed up the decade.

Hurwitz ... brought to Pacific Lumber a massive debt, which the company can pay off in only one way: cutting more trees.

Pacific Lumber was always profitable, but it never made the kind of money that would allow it to pay off a debt of that magnitude and still turn a profit.

Because Michael Milken invented this wonderful new tool called the junk bond, twice as many trees are crashing to the ground in Humboldt County.

Listen to Greg King, a local environmental activist: "There's one grove in there that epitomizes it all for me. We call it Headwaters Forest. ... There's a tree in there I just found that's between fifteen and twenty feet in diameter. One gets the feeling of being dropped into a world totally apart from this planet".

[8] Reader's Digest (November 1989; M. Walters) — **California's Chain Saw Massacre**

Magnificent, ancient redwoods, once carefully harvested jewels in the Pacific Lumber Company's crown, have become expendable pawns in a game of leveraged buyout – and corporate greed.

Since the early 1940s, Pacific Lumber practiced selective harvesting ... The company prospered by this careful harvest of its vast holdings.

... many believe that interest payments on the company's debt, not sound forest practice, drive company policy.

"We went into an area where probably no man had set foot in a century or more", an (unnamed) employee said. "It was a wonderland in there and everything standing was felled. We left a moonscape".

[9] Sierra (July/August 1990; G. King and M. Mardon) — **Last Stand for the Redwoods**

In January, three Northern California lawmakers met with MAXXAM Corporation's Hurwitz at a so-called "timber summit", which produced a two-year moratorium on logging the Headwaters Forest.

On March 1, three Earth First! hikers discovered a bulldozer cutting a 28-foot-wide road into the Headwaters Forest. ... PALCO claims the road is necessary to provide access for wildlife observation.

[10] New York Times Magazine (11/4/90; T. Gabriel) — **If a Tree Falls in the Forest, They Hear It**

The grove is deeply shadowed, with streaky beams of light penetrating the multilayered canopy. But the scars of logging are already to be seen: haul roads and skid tracks used by bulldozers to drag fallen trees off the hillsides.

Pacific Lumber had doubled its rate of cutting to pay off junk bond debts after it was acquired in a hostile takeover and the company wasn't much interested in selling or donating its trees for parks.

[11] New York Times (3/27/91; R. Reinhold) — **Failure of S. and L. Could Save a Redwood Forest in California**

Loggers have never entered the (Headwaters) forest, and many trees are 1,700 years or older and stand taller than the Statue of Liberty.

Environmentalists began to become alarmed about the land when MAXXAM took over the company that owned it, Pacific Lumber, and doubled the rate at which it felled the valuable redwoods on its land to pay off the $795 million debt it took on to finance the purchase.

[12] Christian Science Monitor (4/1/91; S. Armstrong) — **Loggers, Environmentalists and State in Knotty Fight Over California's Redwoods**

The 3,000 acre Headwaters Forest in northern California harbors trees taller than Norman Scharzkopf and older than the crusades.... "It is like the last great buffalo herd", says John Amodio, environmental adviser to California Gov. Pete Wilson.

[13] Time (4/8/91; unnamed) — **Environment: Barking Up the Right Tree**

Buy a junk bond, save a redwood (picture caption).

[14] Christian Science Monitor (6/5/91; B. Knickerbocker) — **Political Debate Surrounds Pacific Lumber**

If Hollywood ever decides to make a film about a company town, this (Scotia) is the place to come to.... Now this company town is also at the center of a controversy over the logging of redwoods and the protection of old-growth forests. Pacific Lumber is the largest private holder of such forests.

For decades the company cut conservatively.... It had a good reputation with environmentalists. Then in 1985, the company was taken over by MAXXAM Inc., a Houston conglomerate. To pay off the $754 million in junk bonds arranged by Drexel Burnham Lambert Inc. to finance the hostile takeover, Pacific Lumber under the new ownership doubled its rate of cutting...

[15] Washington Post (1/19/93; A. Sloan) — **How Complex are Charles Hurwitz's Tree-Backed Bonds? Don't Ax. (Allan Sloan column)**

Hurwitz stepped up the cutting rate to help generate cash to pay for his junk bonds. Environmentalists have been after him ever since, as have the Labor Department and the Interior Department.

[16] New York Times (6/4/93; J. Markoff) — **A Legal Thicket Amid the Redwoods**

"This was the crown jewel of the North American timber industry", he (Mr. Bertain) said. "I was just stunned for four months after the takeover..."

For many residents of this community (Eureka), the Pacific Lumber takeover has come to epitomize the social and environmental costs of the junk bond era of the 1980's.

Environmentalists have used Pacific Lumber's logging practices as the rallying point in their battle to save the remaining stands of California's old-growth redwood forests. "This is in-your-face forestry", said Joshua Kaufman, a Humboldt County paleontologist who helped form an environmental coalition after he saw Pacific Lumber trucks rolling up and down the road on which he lives.

[17] Christian Science Monitor (12/3/93; B. Knickerbocker) — **Debt-for-Nature Swap Proposed Between Uncle Sam and Loggers**

Pacific Lumber was a conservatively operated, family-owned operation until it was taken over in a leverage buyout in 1985.... The company has since been accused of accelerating the cutting of redwood lumber to pay off the debt acquired in the process.

According to Representative Dan Hamburg (D) of California: "These stands... are threatened by the owner's need to harvest aggressively to pay off high interest bond debt incurred to purchase them".

California Rep. Pete Stark (D) is even sharper in his criticism of MAXXAM, which he accuses of "aggressive, greedy management".

[18] Time (6/6/94; J. Skow) — **Redwoods: The Last Stand**
A young activist fights a corporate raider to save an ancient California forest from being cut down

Charles Hurwitz, 54, raided and leveraged his way to an '80s-style fortune...

After he grabbed Pacific in a 1986 hostile takeover, paid for largely with junk bonds issued by Drexel Burnham Lambert's Michael Milken, Hurwitz visited Pacific's mill at Scotia. "There's a little story about the golden rule", he told employees. "He who has the gold rules".

Hurwitz also boosted the rate of old-growth logging; as Congressman Pete Stark, a California Democrat put it, "looting the forest, meeting monthly interest payments by cutting thousand-year-old trees".

Most of the 5,000 to 6,000 acres of privately owned old-growth that remain can be seen in five minutes from a small plane circling inland near Humboldt Bay ... "They want to turn all that into lawn furniture and hot-tub decking", Thron yells over the Cessna's intercom. A much larger area of nearly 40,000 acres is scarred and scraped by bulldozers, its salmon-spawning streams choked with silt.

In 1990 the company (Pacific Lumber) reamed a broad, mile-and-a-half corridor into the middle of the Headwaters forest and called it, with a wink and a snicker, "our wildlife-biologist study trail".

[19] Sierra **MAXXAMizing Profits**
(July/August 1994; P. Rauber)

Charles Hurwitz' America is a merciless jungle of capitalist predation, where 2,000 year-old trees are interest payments on high-risk debt. In his America, friends like Michael Milken can float $900 million in junk bonds to finance the takeover of a century-old company like Pacific Lumber.

Pre-Hurwitz, the company (Pacific Lumber) never cut more than it grew in a year. After Hurwitz' MAXXAM Corporation gobbled it up in 1985, the company doubled the cut in order to pay off Hurwitz' junk-bond debt, using clearcuts for the first time in its history. Hurwitz proposed to liquidate the ancient forest entirely within 20 years.

[20] U.S. News and World Report **Trading Tall Trees for Debt: A Unique Deal for a Forest and a Financier?**
(8/29/94–9/5/94; M. Satchell)

The towering 800-year-old redwoods are a gothic cathedral of arboreal splendor ... But for Charles Hurwitz, who owns the (Headwaters) forest through the Pacific Lumber Co., the aesthetic of these trees lies in the bottom line. As lumber for decking, paneling, hot tubs and furniture, the Headwaters may be worth several hundred million dollars.

To help pay off the 12.5 percent interest on the bonds, Hurwitz began logging the more lucrative old-growth tracts at double the company's sustainable harvest rate.

[21] Christian Science Monitor **California's Redwoods: Saw or Save? Row Over World's Largest Private Old-Growth Grove Reignites**
(9/18/95; B. Knickerbocker)

Until 10 years ago, the family-operated business was known as a conservative steward of private holdings.... Then, in 1986, the company was acquired by

MAXXAM ... in a $900 million buyout involving high-risk junk bonds financed by Michael Milken and Drexel Burnham Lambert Inc. Critics say Hurwitz then ordered Pacific Lumber to accelerate timber cutting in order to pay off the bonds.

"We believe that a debt-for-nature swap is the best way for the taxpayers to recover their debt from Mr. Hurwitz and also save the Headwaters Forest from destruction", five members of Congress from California wrote the FDIC last week.

[22] Washington Post **Ax Now, Pay Later Money Trees: A Clear-Cut Case of Corporate Foolishness (Review of David Harris' book titled The Last Stand)**
(1/22/96; N. Langston)

In "The Last Stand", David Harris tells a chilling story of the links between the hostile corporate takeovers of the 1980s and the decimation of old-growth forests.

[23] New York Times Sunday Book Review **Hostile Environment: what happens when insider trading collides with the great outdoors (Review of David Harris' book titled The Last Stand)**
(1/28/96; M. Dowie)

There are few places where the battle between cowboy capitalism and wilderness preservation has been fought with such ferocity as Scotia ...

It all began in 1985 when a smooth-talking corporate raider from Houston decided to buy all the shares of Scotia's only employer, The Pacific Lumber Company, a prosperous but undervalued family business whose bylaws stated that the welfare of the area where it operated had to be on an equal footing with the financial rewards to shareholders.

In 'The Last Stand', David Harris spins a fast-paced and colorful yarn of Scotia's concurrent introductions to Wall Street greed and radical environmentalism. Mr. Harris recounts a descent into modernity that began the day Charles Hurwitz ... began to accumulate the common stock of the lumber company, run for three generations by the Murphy clan, a family committed to sustainable yield forestry and perpetual community.

Neither of those values was of particular interest to Mr. Hurwitz.

[24] Rolling Stone **The Last Stand (Adapted from David Harris' book of the same title)**
(2/8/96; D. Harris)

The battle raging over the Pacific rain forest broke out of the backwoods and into the national spotlight 10 years ago in the far northwestern corner of

California.... And it still rages there to this day, a head-on collision at the intersection of Wall Street, Our Town, and Ecotopia. The conflict remains an indelible modern parable for all of us about just what happens when Big Money invades a small place full of very, very big trees.

Investors in the junk bonds that Milken issued to fund Hurwitz's takeover were assured of security by a promise to drop the pace set by Murphy, open up the throttle for the purposes of short-term yield and at least double Pacific Lumber's annual timber harvest.

... clear-cutting became company policy, and in the first months of the company's speeding up, a lot of timber was lost in splinters as inexperienced fellers, paid by the log, dropped trees in great haste just to get into the truck what they could... (leaving) hillsides plucked as clean as chicken skin.

Headwaters Forest continues to hang in the balance this year as it has for the 10 that preceded it.... You either want to save what's left or you want to cut it down – one side or the other with no room in between.

[25] New York Times (4/21/96; C. Goldberg) **Environmentalists' Hopes Gleam on a Special Grove of Redwoods**

The sublime objects of these passions stand silent, as they have since long before Columbus reached the new world, their sylvan beauty marred only by a blue slash of paint here and there across their mammoth trunks – a slash that means "marked for harvest".

[26] Christian Science Monitor (7/29/96; B. Knickerbocker) **Future of Redwoods Hinges on Government Land Swap**

In an unfriendly takeover involving high risk junk bonds, MAXXAM acquired Pacific Lumber and its 195,000 acres of timber land in 1986. The family operated California timber company had conservatively managed its forest for more than 100 years. When MAXXAM took over, the rate of cut in the redwoods was doubled in part to pay off the debt incurred in buying the company.

.... environmentalists have been pushing a "debt-for-nature" swap in which the Texas financier would give up Headwaters Forest in exchange for taxpayer costs associated with his dealings.

[27] New York Times (9/15/96; D. Brower) **Forest on the Verge (David Brower opinion piece)**

Headwaters is a national treasure and one of our last connections to a primeval past. If President Clinton saves it, he will have the backing of the American people and the gratitude of generations to come.

[28] New York Times (10/3/96; unnamed) **A Fragile Redwood Deal (Editorial)**

The forest is owned by the Pacific Lumber Company, acquired in a leveraged buyout in 1986 by Charles Hurwitz, a prominent Texas financier and savings-and-loan operator. To pay down his debt, Mr. Hurwitz has been cutting redwoods and other trees...

[29] US News and World Report (10/7/96; M. Satchell) **To Save the Sequoias**

If all great dramas need a villain and a hero, Hurwitz fits both roles. Environmentalists have vilified him as a corporate raider intent on liquidating ecologically priceless, virgin sequoias that could be up to 2,000 years old.... (S)upporters see... (him) as a jobs-generating entrepreneur unfairly victimized by the Endangered Species Act.

[30] Time (10/14/96; J. Skow) **Ransoming Redwoods From a Timber Tycoon**

The fifth or sixth reel of an ongoing eco-melodrama involving the threatened cutting of ancient California redwoods on the foggy north coast flickered to a close last week, though more perils lurked. There lay the heroine, hog-tied to the tracks; there came the choo-choo; there gloated the villain, twirling his mustache. Logging was to begin in three days. Negotiators for the U.S. Department of the Interior were scripted as heroes...

[31] People (11/11/96; T. Fields-Meyer et al.) **Forest Gumption: A Stubborn Activist Takes on a Tycoon in a Fight for the Redwoods' Survival**

Pre-Hurwitz, family-run Pacific Lumber had logged selectively to preserve the forest ecosystem. But Hurwitz, 56, burdened by MAXXAM's $750 million debt from buying Pacific and its 200,000 acres, looked at redwood trees – some as old as 2,000 years – and saw cash. Promptly, he doubled the logging rate.

II. National financial press

[32] Business Week (2/2/87; J. Norman) **A Takeover Artist Who's Turning Redwoods Into Quick Cash: Charles Hurwitz' Debt-Laden Empire Can Sure Use It Now**

Critics say Hurwitz has abandoned Pacific Lumber's traditional policy of measured cutting in favor of a "rape and run" strategy that could make Scotia just another timber ghost town.

... Hurwitz is scrambling to rev up cash flow by liquidating the old-growth redwood as quickly as he can.

[33] **Barron's** (9/28/87; D. Henriques) **The Redwood Raider: Charles Hurwitz Stirs Up the Dust Again**

... environmentalists – who are angry because MAXXAM has been obliged to double its annual timber harvest to service the heavy load of the debt Hurwitz took on in the PALCO takeover – have filed suit to block ... state-approved harvest plans.

[34] **Barron's** (12/7/87; D. Henriques) **Where There's a Will ... Hurwitz Finds a Way to Get Cash**

The cast of characters alone resonates for any student of recent Wall Street history. There's Hurwitz, of course, fresh from his appearance before a House subcommittee exploring takeovers in general and his takeover of Pacific Lumber Co. in particular. It seems that some congressmen were worried that Pacific Lumber shares might have been parked with broker Boyd Jeffries, implicated in and now cooperating with the government's sprawling insider trading investigation. Hurwitz insisted there was absolutely nothing untoward in his accumulation of Pacific Lumber shares.

[35] **Business Week** (3/21/88; unnamed) **Don't Clamp Down on the Dealmakers (Editorial)**

Still ... there are horror stories about the consequences of excess leverage. MAXXAM Group Inc., which acquired Pacific Lumber with a huge issue of junk debt, is sawing down 1,000-year-old redwoods to meet payments.

[36] **Fortune** (4/24/89; E. Schultz) **A Raider's Ruckus in the Woods**

Leveraged buyouts can bring blessings to companies and the people who work for them. But if you want to see one deal's unseemly effects, take the 19-seat American Airlines puddle jumper from San Francisco 260 miles up the rugged northern California coast to Humboldt County, where shrouds of fog hover in the tops of 2,000-year-old redwoods. The primeval scene suddenly changes when you near Scotia, where Pacific Lumber Co.'s operations are centered. Down below they're felling trees so fast that barren clear-cut patches, covered only with the sluglike tracks of huge log haulers, blot the landscape for miles.

After Houston's Charles Hurwitz got Pacific Lumber, he speeded logging to pay debt. The forest can stand it, the company says, but critics see a Texas chain saw massacre.

Cutting trees to cut debt may have seemed like a simple solution. But to many, harvesting redwoods is akin to filling in the Grand Canyon.

Before the takeover, Scotia (pop. 1,200) was one of a handful of surviving timber mill towns.... The company was founded in 1869 and later acquired by the Murphy clan of Maine, who raised benign paternalism to a management art.... Scotia could have been dropped whole into Disneyland, right between Frontierland and Tomorrowland, as Happy Mill Town.

[37] **Business Week** (11/6/89; J. Levine) **When the Safety Net is Frayed**

When Charles E. Hurwitz took over ... Pacific Lumber Co. in 1985, the Houston Financier scrapped Pacific's pension plan and used its surplus to help pay down his debt. In its place, Hurwitz bought annuities from First Executive Corp., known for its heavy reliance on junk bonds.

[38] **Wall Street Journal** (7/3/92; C. McCoy) **A Mass Flyover by Spotted Owls Could Be a Nice Finale to the Day**

Trouble began this year when a group of prominent locals mounted a local campaign to 'take back' Pacific Lumber from Mr. Hurwitz. He bought it in 1986 in a controversial junk bond deal and immediately accelerated the rate at which it was felling old redwoods, bringing down the wrath of tree-huggers everywhere upon Eureka's collective head.

[39] **Fortune** (7/26/93; F. Rice) **Who Scores Best on the Environment: What companies are in the vanguard of the green revolution – and which are lagging behind?**

Environmental Scorecard – the 10 Laggards: MAXXAM, parent of Kaiser Aluminum and Pacific Lumber, doubled its rate of cutting timber after buying Pacific in 1985, creating an ongoing tug-of-war between environmentalists and the company.

[40] **Wall Street Journal** (8/6/93; C. McCoy) **For Takeover Baron, Redwood Forests Are Just One More Deal: Hurwitz wants U.S. to buy his trees for $600 million or he'll let chainsaws in**

It is a proposal that brings new meaning to the term greenmail.

Financier Charles Hurwitz wants the U.S. government to pay him hundreds of millions of dollars for 4,500 acres of the ancient redwoods, in a remote California grove known as the Headwaters Forest. Otherwise, he says, he will press ahead with his plans to cut the trees down.

MAXXAM is a creature of the 1980s takeover and junk bond frenzy, and remains heavily indebted.

The raid became an exemplar of 1980s style finance: He blitzed a sleepy, under-valued old company, famous for its environmentally conscious logging practices. Suspicions of insider trading abounded, including allegations involving junk bond king Michael Milken and trader Ivan Boesky.

Under Mr. Hurwitz, Pacific Lumber began cutting down redwoods at twice the company's historic pace, to pay down debt. Pacific Lumber has been warring with environmentalists ever since. "Pacific Lumber", says Kathy Bailey, a Sierra Club forestry expert, "is the archenemy".

In June and November of 1992, over weekends and holidays when wildlife regulators weren't working, Pacific Lumber cut down hundreds of redwoods and firs in Owl Creek – despite warnings from regulators that doing so might violate wildlife laws, and despite previous agreements that regulators insist committed the company to hold off logging ... Says James Steele, the top state biologist for Owl Creek: "They basically conducted sneak attacks out there".

At a New York lunch last year, Mr. Hurwitz was surrounded by admiring Wall Streeters. According to attendees, Mr. Hurwitz took in the plaudits and observed: "wait till you see what happens with Pacific Lumber – it's going to be worth a whole lot more than you think ... a *whole* lot".

[41] Wall Street Journal (6/3/94; D. Rogers and C. McCoy)
Ex-Congressman Who Assailed Timber Concerns Now Supports Logging and Seeks to Reclaim Seat

In 1990, the incumbent Democratic congressman in California's Redwood Empire attacked the "cut and run ... junk bond" timber companies that were blasting the forests of his district, logging their way out of jobs and ruining salmon habitat.

[42] Wall Street Journal (10/20/94; C. McCoy)
A Giant Logger and a Tiny Bird Test Limits of Conservation Law

Pacific Lumber maintains it had every right to log in Owl Creek.... But regulators didn't see it that way and furious environmentalists sued. They accuse Pacific Lumber of violating the Endangered Species Act by destroying murrelet habitat and seek to block logging in the grove.

Pacific Lumber's top logging manager, Ray Miller, conceded on the stand that its murrelet surveyors – who are supposed to scour proposed logging lands for signs of the birds and report to regulators – were under orders not to record certain evidence used to determine logging restrictions.

[43] Business Week (2/26/96; E. Schine)
A 1980s Chainsaw Massacre (Review of David Harris' book titled The Last Stand)

Even by the rapacious standards of the 1980s, Hurwitz' 1985 hostile takeover of Pacific Lumber Co. stands out, largely because it precipitated an assault on the 183,000 acres of redwoods acquired in the deal. But according to the Darwinian rules of 1980s' dealmaking, Hurwitz had little choice. Financed with more than $800 million in junk bonds, the Pacific Lumber deal worked only if Hurwitz serviced the debt by doubling, then tripling, the rate of lumbering.

In the frenzy to cut trees, Hurwitz also managed to overturn a well-run family business ...

... Drexel's Michael Milken, with a wave of his hand, agrees to peddle the junk bonds to his network of customers, while Ivan Boesky and Boyd Jeffries quietly park big chunks of Pacific Lumber stock until Hurwitz is ready to pounce.

[44] The Economist (3/16/96; unnamed)
American Redwoods: Spare that Tree (Review of David Harris' book titled The Last Stand)

... Pacific Lumber Company was a model forestry and logging firm as well as a model of corporate paternalism. It was also the owner of the last big swathes of old-growth redwood forest until it fell foul of the greedy takeover culture of the 1980s.

At stake were the remaining giant redwood trees, *sequoia sempervirens*, of California's coastal forests. Some of them were more than 1,000 years old; many of them were more than 200 ft (60 m) high and 15 ft wide. Under the Murphy family, members of which operated the firm from 1904 onwards, these prize assets were treated with deference.

[45] The Economist (5/11/96; unnamed)
Of Murrelets and Redwoods

Demolishing a cathedral (picture caption).

[46] Business Week (8/5/96; E. Schine)
Save California's Redwoods – But Not This Way (Eric Schine opinion piece)

Consider it the Charles E. Hurwitz Relief Fund. After bailing out the Texas dealmaker's failed savings and loan association to the tune of $1.6 billion, the U.S. government is now on the verge of doling out thousands of acres and hundreds of millions of dollars worth of federal lands to him.

III. Major Los Angeles and San Francisco newspapers

[47] SFC Image Magazine **The Takeover**
(7/13/86; D. Abramson)

The residents of Scotia thought their way of life could go on forever, sustained by the redwoods that surrounded them and the enlightened managers of Pacific Lumber, the company that owned it all. Last September, they found out they were wrong.

[48] SF Chronicle **Humboldt Battle Over Cutting Old Redwoods**
(1/5/87; G. Snyder)

North Coast environmentalists are gearing up for a long war against a Humboldt County lumber company that plans to cut what could be fully one-quarter of the virgin redwood trees left in the world.

[49] LA Times **A Tale of Two Owners: Old Redwoods, Traditions Felled in Race for Profits**
(4/20/87; I. DeBare)

It is a story of the collision of 1980s Wall Street finance with a century-old, family run company, a story of junk bonds printed on redwood pulp.

"This was all untouched on Monday", Newman said, shaking his head .... Newman, a member of the radical environmental movement Earth First! was walking on timberland owned by Pacific Lumber Co. The clearing was once a grove of old-growth redwood trees between 200 and 2,000 years old ....

[50] LA Times **Redwoods: a Cash Crop (Editorial)**
(7/10/87; unnamed)

Junk bonds have been blamed for all manner of things in this age of corporate buccaneering, but for the ravaging of California redwood forests? Pacific Lumber Co. has been cutting old-growth redwoods like crazy on California's north coast this year, apparently to pay off the bonds used by Charles Hurwitz' MAXXAM Group to take control of Pacific in late 1985.

[51] LA Times **From Rhetoric to 'Ecotage': Environmental' Fanatics Try to Keep Things Wild**
(11/29/87; M. Stein)

Perched on a small, unsteady plywood platform 130 ft above the earth in the crown of an ancient coastal redwood, Greg King saw the light. It was a searchlight. And it was pointed at him .... by crews working for the tree's owner, Pacific Lumber Co.

King and Cope (another protester) eventually rappelled undetected down the husky conifers for a swift and silent escape, but not until they had turned their own spotlight – the glare of national publicity – onto the practice of clear-cutting virgin timber. The treetop antics also won no small measure of attention for Earth First!, a 7 year old band of environmental activists and ecological saboteurs who promise "no compromise in defense of Mother Earth".

[52] LA Times **Protecting Redwoods (Editorial)**
(4/26/88; unnamed)

There is currently the controversy over Pacific Lumber Co.'s logging of old-growth redwoods in Humboldt County. Pacific greatly accelerated its cutting after the venerable California firm was taken over by the MAXXAM Group. The reason, the firm acknowledges, is to raise cash to pay off the junk bonds used to finance the takeover. Environmentalists were outraged, which is no surprise. But even Pacific employees have been disturbed by the timber-cutting practices to the point of resigning their jobs or speaking out in public.

[53] SF Chronicle **A Question of Trees vs. Jobs: Ecologists Battle the Timber Industry on the North Coast**
(5/16/88; K. Pender)

The latest round of environmental action was sparked by the 1986 takeover of Pacific Lumber by MAXXAM Group, which is controlled by Houston financier Charles Hurwitz. PL had been one of the nation's most conservatively managed timber companies. But to repay the $600 million-plus he borrowed to acquire PL, Hurwitz doubled the company's cutting rate.

[54] SF Chronicle **What Makes Charles Hurwitz Tick?**
15/26/88; K. Pender)

He loves to borrow money – lots of it – to finance acquisitions.

Hurwitz in the past has been accused of milking companies for their cash to finance his next acquisition. After acquiring Pacific Lumber, Hurwitz doubled the company's timber cutting rate. His moves have sparked widespread opposition by environmentalists and some legislators ....

[55] SF Chronicle **Lumber Builds an Empire**
(11/22/88; unnamed)

MAXXAM has nearly tripled Pacific Lumber's redwood cut to pay off acquisition financing ....

Opponents to MAXXAM's tree-cut plan, such as Earth First!, are more outspoken than bondholders. Next month, they will march in Humboldt County wearing black capes and Hurwitz masks in a macabre protest.

[56] LA Times (4/25/89; R. Jones)
Feeding Frenzy in the Redwoods (Robert Jones opinion piece)

If you look on page 39 of the federal indictment of Michael Milken, you'll see the reason for this story. That's where the feds describe how – in their opinion, at least – the king of junk bonds pulled on the levers of capitalism, got all the gears cranking and eventually caused whole forests of redwoods to come crashing down along California's North Coast.

Even now, the chain saws are howling in the forests surrounding this small lumber town (Scotia). They are cutting to pay some heavy bills, debts that were incurred 1,000 miles south in the Beverly Hills offices of Drexel Burnham Lambert. The connection between those chain saws and Milken may turn out to be a milestone of the '80s.

[57] SF Chronicle (5/4/89; J. Pelline)
MAXXAM Chairman's Pay: $3.95 Million

Texas financier Charles Hurwitz, chairman of MAXXAM Inc., earned $3.95 million last year – more than the pay of the chief executive of Bankamerica Corp., Hewlett-Packard Co., and Pacific Gas and Electric combined. If his company had been based in the Bay Area, the 48-year-old Hurwitz would have been the area's highest-paid executive.

Betsy Ball, coordinator of the Mendocino Environmental Center, called Hurwitz's compensation "obscene – especially from a company that profits from raping the forest".

[58] SF Chronicle (11/30/89; E. Diringer)
Governor Asked to Help Save Ancient Redwoods

"We are calling on Governor Deukmejian to silence the chain saws poised over the Headwaters Forest", declared Edgar Wayburn, a Sierra Club vice president. "This is the heart of the largest unprotected old-growth forest in the world .... This is the last stand".

[59] SF Chronicle (11/30/89; J. Pelline)
Environmentalists Irked: Pac Lumber Chief Reaping Rewards

Charles Hurwitz's not-so-subtle timber-cutting techniques aren't winning him friends in the environmental movement, but the chairman of MAXXAM Inc. is chopping out substantial rewards for his company's shareholders – most notably himself.

[60] LA Times (1/27/90; M. Stein)
Plan to Log Redwoods Hits a Buzz Saw of Opposition

Critics of the logging proposal ... say it would sacrifice valuable wildlife to pay off hundreds of millions of dollars in high-interest "junk bonds" used by (MAXXAM) to seize Pacific Lumber in a 1985 hostile takeover. That takeover figures prominently in the federal insider-trader case against Michael Milken ....

[61] LA Times (2/11/90; P. Melnik)
Into the Woods: Where Virgin Sequoias Have Reapers and Savers at Loggerheads

In the pre-dawn darkness, we stumble along the gravel road leading into Pacific Lumber Co.'s private forest. We are trespassers in the most political woods in California .... I'm breaking the law because I want to see Headwaters Forest firsthand ....

The forest is so dense that even at noon only a shaft or two of sunlight reaches its floor. From the sword ferns to the tufts on the leaves, everything is a gentle yellow-green .... We mostly wade through massive clumps of ferns, occasionally walking on fallen tree trunks. The redwoods are colossal – 250 feet high, with trunks the size of a Volkswagen Beetle.

... as we leave Headwaters, I stop to look back. Some of the trees were here when Jesus was preaching. As the setting sun turns the sky an ashen rose, I wonder how many of them will make it to the year 2,000.

[62] LA Times (8/19/90; M. Parrish)
Western Environmentalists' Enemy No. 1

On a May evening in Houston, a mock logger with a real chain saw dismembered a hunk of redwood at the 50th birthday banquet of financier Charles E. Hurwitz. Just a poke in the ribs, Texas-style for Western environmentalists' most hated foe.

.... for five years, Hurwitz has been at the top of the enemies list as he has doubled the logging rate on the world's last big, private tract of old-growth redwoods – 1,000-year-old trees that environmentalists view as unique, irreplaceable wildlife habitat.

Since he launched a successful takeover of Northern California's Pacific Lumber Co. in 1985, Hurwitz has been a symbol of the various presumed evils of corporate raiders.

[63] SF Chronicle (7/14/92; J. Pelline)
Timber Firm Has Growth Problem: Environmentalists stymie Pacific Lumber bid to harvest old-growth forests

As the biggest private owner of old-growth redwoods, (Pacific Lumber) has been a key target of environmentalists. And since it was taken over by an out-of-state conglomerate controlled by a multimillionaire Texas investor, the Scotia-based company has come to symbolize the more controversial leveraged buyouts of the 1980s.

[64] SF Chronicle (8/5/93; J. Pelline)
U.S. May Try to Buy Old Growth Forest But Pacific Lumber Might Not Be Willing to Sell It

"These stands (in Humboldt County) are threatened by the owner's need to harvest aggressively to pay off high interest bond debt incurred to purchase them", U.S. Representative (D) Dan Hamburg charged yesterday. "If these ancient trees are cut, the old-growth ecosystem is lost. The old-growth redwood forest is not a renewable resource".

Hurwitz outraged environmentalists when he bought Pacific Lumber in a 1985 leveraged buyout, temporarily doubling the company's timber cut to pay off junk bond debt.

[65] LA Times (9/4/94; unnamed)
Seeking Longer Life for Some of Our Elders: Innovative Bill Would Protect Tract of Ancient Redwoods (Editorial)

An aerial view of the Headwaters Forest in Humboldt reveals dense green stands of old redwoods, some of which have survived since before Rome fell. But just as prominent are acres of desolate land criss-crossed by now-abandoned logging roads.

Cutting has intensified since 1986 when the Pacific Lumber Co., whose old-growth grove is the largest privately owned patch of these trees anywhere, was acquired by financier Charles Hurwitz, head of the Houston-based conglomerate MAXXAM Inc. Many feared that old-growth logging increased to meet the monthly interest payments on MAXXAM's massive debts.

This forest is much too valuable to end up as 'lawn furniture and hot-tub decking', as one environmentalist says.

[66] SF Chronicle (4/28/95; G. Martin)
New Stand in Fight Over Old Redwoods

Pacific Lumber .... was acquired in 1986 by MAXXAM Inc., which has been criticized by conservationists for greatly increasing the harvest to pay off the high-interest 'junk bonds' it used to finance the takeover.

[67] LA Times (9/7/95; P. Stark and G. Brown)
Dealing with a Raider to Save a Forest (Opinion piece by Congressman Sark and Brown)

For 117 years, family-operated Pacific Lumber Co. was a model corporation.

In 1985, corporate raider Charles Hurwitz recognized Pacific Lumber as an undervalued asset and with his friends Michael Milken and Ivan Boesky, orchestrated a takeover of Pacific Lumber primarily through high-interest, high-risk junk bonds.

Hurwitz has been logging the Headwaters Forest at an unprecedented rate so that he can pay off his debts.

[68] SF Chronicle (7/20/96; A. Barnum)
Land Swap Could Save Huge Grove of Virgin Redwoods

MAXXAM acquired the Headwaters Forest in its 1986 hostile takeover of Pacific Lumber. After the buyout, the company doubled logging of its redwood forests to pay off junk bonds it issued in the acquisition, prompting a long battle with environmentalists.

[69] LA Times (7/25/96; F. Clifford)
Land Swap to Preserve Old Redwood Forest takes Root

With the likes of junk bond impresario Michael Milken on one side and the radical environmentalist group Earth First! on the other, Headwaters has become a symbol of Wall Street excess or of lawless activism, depending on your point of view.

[70] LA Times (7/26/96; unnamed)
Saving California's Giants (Editorial)

A Clinton administration land-swap proposal could save the trees, but the president will need to act quickly. At the same time, ... Pacific Lumber Company ... will have to acknowledge that intact and standing, these trees are infinitely more valuable to Americans than if they were cut up into lawn furniture and hot tub decking. Indeed, they are priceless.

[71] LA Times (8/2/96; A. Cockburn)
The Feds Blinked on Redwood Swap (Alexander Cockburn opinion piece)

Environmentalists have been pushing for a 'debt-for-nature' swap. Hurwitz would surrender up to 60,000 acres of redwood forest to the federal government. In return, he would be relieved of his $750 million (S&L) obligation.

[72] SF Chronicle (9/9/96; unnamed) — **Heading Off Disaster in Headwaters Forest (Editorial)**

Why is Hurwitz suddenly so eager to send chainsaw gangs charging into groves that Pacific Lumber left untouched for more than a century?

Perhaps it has something to do with his negotiations with the Clinton administration, which is anxious to take the largest stand of virgin redwoods out of private hands. Hurwitz has been demanding up to $500 million of other properties as compensation.

[73] LA Times (9/13/96; unnamed) — **A 2,000 Year-Old Redwood is a Precious Thing to Lose (Editorial)**

The Wilson and Clinton administrations seem sincere in their desire to stop the company from cutting these redwoods. This unseemly standoff should end with the public in possession of the Headwaters grove and the company fairly compensated but not grossly enriched.

[74] LA Times (9/18/96; P. King) — **Once More, Into the Redwoods (Peter King opinion piece)**

The 3,000 acre grove is not controlled by any old Johnny Lumberjack, but rather by a corporate raider from Houston who ran with Michael Milken in the glory days of junk bonds and hostile takeovers.

[75] LA Times (9/26/96; A. Cockburn) — **Look Beyond Grand Canyon Photo Ops (Alexander Cockburn opinion piece)**

Finally came a strong White House push for a deal whereby Clinton will be able to announce before the election that he has saved the Headwaters Grove in Northern California ....

[76] LA Times (10/1/96; unnamed) — **Saving Habitat, Not Just Big Trees (Editorial)**

The state forestry laws that would have let Pacific Lumber log its Headwaters lands should now be revisited. Wilson and the legislature ... should aim to more tightly limit logging in California's old growth forests ....

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